Queen Charlotte Sound Groundfish Bottom Trawl Survey, July 3rd to August 10th, 2003

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by

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ABSTRACT

Olsen, N., Workman, G.D., and Stanley, R.D. 2007. Queen Charlotte Sound groundfish bottom trawl survey July 3rd to August 10th, 2003. Can. Manuscr. Rep. Fish. Aquat. Sci. 2782: vi + 58 p.

A bottom trawl survey of Queen Charlotte Sound and southern Hecate Strait was conducted on the fishing vessel F/V Viking Storm between July 3rd and August 10th, 2003. The survey was jointly conducted and funded by the Canadian Groundfish Research and Conservation Society (CGRCS) and Fisheries and Oceans Canada (DFO), and was the first in what is intended to be a long-term and coordinated set of surveys that cover the continental and upper slope of the continental shelf of most of the British Columbia coast. The objective of these surveys is to provide fishery independent abundance indices of all demersal fish species available to bottom trawling, as well as to collect biological samples of selected species.

The survey conducted 239 successful tows from a total of 253. The mean catch per tow was 377 kg, averaging about 16 different species of fish and invertebrates each. The most abundant fish species encountered was Pacific ocean perch followed by arrowtooth flounder, redstripe rockfish, and splitnose rockfish. Biological data, including individual length, weight, sex, maturity, and age were collected from 51 different species of fish. Oceanographic data and net geometry were also recorded for most tows, including water temperature, depth, headrope height, doorspread, and current velocity through the net.

RÉSUMÉ

Olsen, N., Workman, G.D., and Stanley, R.D. 2007. Queen Charlotte Sound groundfish bottom trawl survey July 3rd to August 10th, 2003. Can. Manuscr. Rep. Fish. Aquat. Sci. 2782: vi + 58 p.

La Canadian Groundfish Research and Conservation Society (CGRCS) et Pêches et Océans Canada (MPO) ont financé et procédé conjointement à la réalisation d'un relevé au chalut de fond dans le bassin Reine-Charlotte et le sud du détroit d'Hécate du 3 juillet au 10 août 2003. Mené par le navire de pêche F/V *Viking Storm*, ce relevé est le premier d'une série prévue de relevés coordonnés à long terme du plateau continental et de la partie supérieure du talus de la majeure partie de la côte de la Colombie-Britannique. L'objectif de ces relevés est l'établissement d'indices d'abondance, indépendants de la pêche, de toutes les espèces de poissons démersaux capturables au chalut de fond et la collecte de données biologiques sur certaines espèces.

Des 253 traits de chalut, 239 ont été fructueux. Les prises moyennes par trait se chiffraient à 377 kg. Quelque 16 espèces de poissons et d'invertébrés ont été prises en moyenne à chaque trait. Le sébaste à longue mâchoire était l'espèce la plus abondante; venaient ensuite la plie à grande bouche, le sébaste à raie rouge et le bec-de-lièvre. Des données biologiques (longueur, poids, sexe, stade de maturité et âge) ont été recueillies pour 51 espèces de poisson. Des données océanographiques (température de l'eau et profondeur) et des données sur la géométrie du chalut (hauteur de la ralingue supérieure, écartement des panneaux et vitesse du courant à travers le chalut) ont également été collectées pour la plupart des traits.

INTRODUCTION

In 2003 a report by the Pacific Scientific Advice Review Committee (PSARC) recommended development of fishery independent relative abundance indices using bottom trawl surveys in British Columbia waters (Sinclair et al., 2003). As an initial step, it recommended that a pilot survey be conducted in PMFC major areas 5A and 5B (Queen Charlotte Sound, Figure 1). This region was recommended in part because it is not covered by other bottom trawl surveys and it represents a significant portion of the commercial bottom trawl fishery.

In February 2003, the Canadian Groundfish Research and Conservation Society (CGRCS) committed to funding the principal portion of the required vessel and net costs, and a significant portion of the scientific staff needed to conduct the survey and analyze the results. The Science Branch of Fisheries and Oceans, Canada (DFO) committed to funding additional scientific and sampling staff, and to provide the scientific sampling equipment.

This document provides a brief synopsis of the of the 2003 Queen Charlotte Sound groundfish bottom trawl survey, including the methods used and data collected. It is not intended as a comprehensive review of the survey, nor does it provide interpretive analysis of the survey results. These topics will be covered in more detailed companion documents.

METHODS

VESSEL AND FISHING GEAR

The survey was conducted aboard the commercial stern trawler F/V Viking Storm (Figure 2). The trawl net used was an Atlantic Western IIA box trawl (Sinclair et al. 2003) connected to 815 kg Thyboron 104 doors with 11 m door legs.

STAFF SUMMARY

A total of 20 personnel were involved in the survey, which was split into 4 sections or "legs", each of about 10 days in duration with 10 staff in each. The Canadian Groundfish Conservation and Research Society (CGCRS) funded employees of Leader Fishing Ltd. and Archipelago Marine Research Ltd. (AMR). All other staff were funded by Fisheries and Oceans Canada (DFO) (Table 2).

SURVEY DESIGN

The study area consists of all of Queen Charlotte Sound and the southern part of Hecate Strait, excluding near-shore waters and inlets, areas closed to fishing, and protected sponge reef areas (Figure 3). The southern portion of Hecate Strait was included in order to provide coverage contiguous with the Hecate Strait groundfish bottom trawl survey. We split the study area into two spatial strata, creating northern and southern regions that split along Mitchell and Reed Troughs. In addition to these areal strata we divided the study area into four depth strata, creating a total of eight strata (Table 3).

We divided the survey area into a contiguous grid of 4 km^2 blocks and from these blocks we randomly selected 240 fishing locations. The number of locations and the allocation of locations across strata were based on an analysis by Sinclair et al (2003) and was intended to minimize observational error for the most important commercial groundfish species.

In addition to the initial selection of 240 fishing locations, which we refer to as the "primary" selection, we randomly selected 80 more locations, allocated in the same proportions as the primary locations. We refer to these locations as the "secondary" selection (Figure 4). The secondary selection was intended to supplement the primary selection in the event that a primary fishing location could not be fished, for example, if the primary fishing location was deemed too rocky for trawling.

OPERATIONS

Fishing

Fishing commenced at sunrise and ended at sunset each day. This yielded an average working day length of 15.5 hours, starting at approximately six o'clock in the morning and ending at about nine thirty in the evening.

On each day prior to fishing, the captain and chief scientist reviewed the list of primary fishing locations to determine a candidate set of locations to visit throughout the

day. During this review process the captain would sometimes determine, based on his experience and knowledge of an area, that one or more locations were not fishable. In such cases we would mark the locations as "rejected" and replace them with the nearest secondary locations. After compiling a list of candidate locations to be visited, the captain would then plan the most efficient route of travel between locations.

We frequently began fishing immediately on arrival at a fishing location. However, if the captain was not familiar with an area we would "sound" the region (traverse the location and examine the depth sounder trace) to determine if it was suitable for trawling. If it was not, we marked the location and "rejected" and selected the nearest secondary location.

When trawling, the captain would attempt to tow through the center of the 4 km^2 fishing block, usually following a depth contour. However, where the bottom topography made this difficult or impossible, the captain would trawl wherever he felt he could obtain a successful result, with the stipulation that at least half of the total trawl track had to be within the 4 km^2 block (Figure 5). The scope used in 2003 is shown in Figure 6 and Table 4.

To determine the start of each 20 minute tow, we monitored the real-time net sensor data to establish when the net reached the sea floor and the headrope collapsed to a height of about three to four meters, at which point we considered the net to be actively fishing. Nineteen minutes after the start of the tow, we retrieved the net. Retrieval was done one minute early because slack in the warps creates a lag of about one minute before the net leaves the bottom. Although our target on-bottom time was 20 minutes, we accepted tows that were at least 15 minutes in length. This was a pragmatic decision that allowed us to retain many tows that would otherwise have been failures due to hang-ups or early haul-backs.

The result of trawling was either a successful tow, or a hang-up or tear-up of the trawl net. In the event of a hang-up or tear-up, we would either mark the location as "aborted" or make additional attempts to fish.

Rejected and aborted locations were removed from the sampling frame for the current survey but were not removed indefinitely from possible selection in future surveys. Instead, we opted for a "three strikes" rule, which stipulates that a location must be removed on three separate surveys before we permanently remove it as a candidate fishing location. This was done in part to avoid a "captain effect" that might arise from variations in local knowledge and skill.

Whenever we removed a location from the primary set, we replaced the location with the nearest available secondary location. This worked reasonably well early in the survey. However near the end of the survey, through a combination of using up all secondary locations in some strata, and having to make pragmatic choices to avoid excessive travel time, we adopted an ad-hoc method of selecting secondary locations in which we identified a small area (10 to 20 blocks) of fishable ground as identified by the captain, and randomly selected a location from within this area.

Gear and Oceanographic Sensors

The trawl net was equipped with a variety of real-time sensors including temperature, depth, doorspread, current velocity, and headrope height. These sensors transmitted data to a bridge computer once per second and allowed us to continually monitor the net during fishing. In addition to these real-time sensors, we also attached data-logging probes to collect water temperature and pressure/depth (Seabird 39) and contact of the trawl net with the sea floor (NMFS Bottom Contact Sensor). Data from these logging probes were downloaded twice per day, once at midday and once at the end of the day.

Catch Processing

Codend contents were dumped into a raised rectangular sorting bin approximately three meters long by two meters wide. Any catch that did not fit into the sorting bin was dumped into a spillway aft of the bin. We completely sorted and weighed the catch to species, except in rare instances when the catch was too large to be sorted in a reasonable amount of time. In these cases we obtained the captain's estimate of total weight, then sorted and weighed all but the dominant species, which was then obtained by subtraction.

Biological Sampling

While the primary purpose of this survey was to generate fishery independent indices of relative abundance, our second goal was to collect associated biological information on the size, sex, and age composition of selected species. In particular, our biological sampling priorities were to collect length and sex frequencies on all species in the catch of each tow (subject to a minimum number of specimens criteria), to collect representative samples of specimen length and weight, and to collect age samples for selected species.

We selected age samples from the dominant catch by weight in each tow, as well as certain species deemed high priority due to concerns over stock status (for example, Bocaccio, lingcod, and Pacific cod). Otoliths (calcareous accretions of the inner ear) were collected from rockfish and flatfish species while fin clips were taken from lingcod and Pacific cod. Both of these structures grow in a series of annular rings that can be counted to determine age.

RESULTS

FISHING

We divided the survey into four sections or "legs" of eight to ten days. This duration was short enough that we were able to retain a significant amount of the catch, which was sold at the end of each leg, and also allowed us to rotate the science crews to minimize fatigue. Each leg began and ended in Port Hardy, located at the north-east end of Vancouver Island, and progressed in a somewhat circular route starting in a northwest direction and ending in a southeast direction, although clearly there were deviations from this pattern, especially by the third and fourth legs (Figure 7).

From a total of 38 survey days, three days were required for travel at the start and end of the survey, four days were required for offloading catch and changing crews, a day was lost due to equipment failure, and two days were lost to inclement weather. Thus, we ended with a total of 28 full fishing days in which time we conducted 253 tows, of which 239 were successful and 14 were unsuccessful due to hang-ups or tear-ups, for an average of 8.5 successful tows per fishing day, or 6.3 successful tows per survey day (Table 5).

The final status of the 2003 sampling frame includes 239 successfully fished locations, 29 locations rejected prior to fishing, and 8 locations rejected after one or more failed fishing attempts (Figure 8).

CATCH

Catch weight per tow was typically less than 1000 kg and on average, we observed about 10 to 20 species per tow (Figure 9 and Figure 10). We caught a total of 97,302 kg of fish and invertebrates. Most of this (95,909 kg) consisted of 107 different taxonomic groups of fish, including 29 rockfish taxa and 12 flatfish taxa. The remainder (1,393 kg) consisted of 66 invertebrate groups (Table 6). Of the fish species, Pacific ocean perch was the most dominant by weight, followed by arrowtooth flounder, redstripe rockfish, and splitnose rockfish (Table 7). Significant amounts of the commercially viable fish catch, especially Pacific ocean perch, were offloaded with the proceeds helping to offset the costs of the survey (Table 8).

SAMPLES AND SPECIMENS

We sampled 51 species of fish for attributes such as length, weight, sex, maturity, and age (Table 9, Table 10, and Table 11).

GEAR AND OCEANOGRAPHIC SENSORS

We collected Seabird 39 data (water temperature and pressure/depth) from 233 of the 253 total tows (Table 12, Figure 11). Tows were missed for a variety of reasons including dead or detached batteries and operator error. Although we have not yet analyzed these data in detail, they may prove useful for explaining, or at least correlate to, short term anomalies in abundance trends. In addition, they provide a base reference for detecting future climate change.

We collected bottom contact data from the NMFS Bottom Contact Sensor for 252 of the 253 tows (Table 12). These data provide a record of the trawl net contact with the sea floor and thus are useful not only for determining the quality and quantity of the sea floor contact, but also indicate the relative rugosity of the sea floor. We used these data to determine the exact times that the trawl net first and last contacted the sea floor, thus providing an accurate measure of total bottom contact time (Figure 12).

Net sensor data, including doorspread, current velocity, and headrope height were collected from most tows but were unavailable from several tows due to equipment failure (Table 12, Figure 13).

REFERENCES

Sinclair, A., Schnute, J., Haigh, R., Starr, P., Stanley, R. D., Fargo, J., and Workman, G. 2003. Feasibility of multispecies groundfish bottom trawl surveys on the BC coast. Can. Stock Assess. Sec. Res. Doc. 2003/049.

Table 1. Net specifications.

Part	Standard Length	Material	Metric Length	Units	Material
Rigging					
Sweep Line	90	7/8 cable	27.4	m	22 mm cable
Upper bridle	90	3/4 cable	27.4	m	19 mm cable
Lower bridle	90	7/8 cable	27.4	m	22 mm cable
Door Legs	36	7/8 cable	11	m	22 mm cable
Pickups	42	7/8 cable	12.8	m	22 mm cable
Hook ups	8.8 t	BMMDV80	8 mt	mt	BMMDV80
Net frame					
Headline	74.5	5/8 cable	22.7	m	16 mm cable
Headline floats	90	8" plastic Spheres			200 mm plastic spheres
Riblines		1" Polysteel rope			25 mm polysteel rope
Bolsch Line	68.33	9/8" poly steel rope	20.8	m	29 mm polysteel rope
Fishing Line	107.33	14 mm long link chain	32.7	m	14 mm long link chain
Foot Rope					
Foot Rope	107.33	5/8 Chain	32.7	m	16 mm chain
Foot rope bosom	14	16 in Tire gear with 2 in Spacing	4.3	m	400 mm tire gear with 50 mm spacing
Root rope wing1	18.33	18" rock hopper, 18 " disks spaced 18 " apart	5.6	m	450 mm rock hopper 450 mm spacing
Root rope wing2	8.83	18" rock hopper, 18 " disks spaced 18 " apart	2.7	m	450 mm rock hopper 450 mm spacing
Web					
Belly	5"	3.5 mm Euroline	127	mm	3.5 mm Euroline
Square	5"	3.5 mm Euroline	127	mm	3.5 mm Euroline
Side Panel	5"	3.5 mm Euroline	127	mm	3.5 mm Euroline
Taper	4.5"	3.5 mm Euroline	114	mm	3.5 mm Euroline
Intermediate	4.5"	3.5 mm Euroline	114	mm	3.5 mm Euroline
Codend	4.5"	3.5 mm Euroline	114	mm	3.5 mm Euroline
Guard Mesh	4.5 or 5 "	Double 4.5 mm Euroline	114 or 127	mm	Double 4.5 mm Euroline
Liner	3/4"	Notless Nylon	19	mm	Notless Nylon

Table 2. Survey personnel for each leg of the survey.

Leg	Dates	Person	Role	Affiliation
1	July 3rd to July 10th	Chris Roberts	Captain	Leader Fishing
		Rick Stanley	Chief Scientist	DFO
		Brian Krishka	Science	DFO
		Norm Olsen	Science	DFO
		Nicole Pellegrin	Science	AMR
		Greg Workman	Science	DFO
		Russell Farrington	Fishing	Leader Fishing
		Mark Lafluer	Engineer	Leader Fishing
		Paul Purston	Fishing	Leader Fishing
		George Sim	Fishing	Leader Fishing
2	July 11th to July 21st	Chris Roberts	Captain	Leader Fishing
		Greg Workman	Chief Scientist	DFO
		Anna Gerrard	Science	DFO
		Jason Knowles	Science	AMR
		Dale Pahti	Science	AMR
		Nicole Pellegrin	Science	AMR
		Russell Farrington	Fishing	Leader Fishing
		Mark Lafluer	Engineer	Leader Fishing
		Paul Purston	Fishing	Leader Fishing
		George Sim	Fishing	Leader Fishing
3	July 22nd to August 1st	Kelly Anderson	Captain	Leader Fishing
		Norm Olsen	Chief Scientist	DFO
		Kris Anderson	Science	DFO
		Ed Choromanski	Science	DFO
		Jason Knowles	Science	AMR
		Janet Lochead	Science	DFO
		Russell Farrington	Fishing	Leader Fishing
		Mark Lafluer	Engineer	Leader Fishing
		Paul Purston	Fishing	Leader Fishing
		George Sim	Fishing	Leader Fishing
4	August 2nd to August 10th	Kelly Anderson	Captain	Leader Fishing
		Rick Stanley	Chief Scientist	DFO
		Darren Fountain	Science	AMR
		Jason Knowles	Science	AMR
		Charlotte Jordan	Science	DFO
		Jonathan Martin	Science	DFO
		Russell Farrington	Fishing	Leader Fishing
		Mark Lafluer	Engineer	Leader Fishing
		Paul Purston	Fishing	Leader Fishing
		George Sim	Fishing	Leader Fishing

Notes: AMR = Archipelago Marine Research
DFO = Fisheries and Oceans Canada

Table 3. Definition of survey strata with the target tow allocation and the total area in each.

Areal Stratum	Depth Stratum Meters	Fathoms	Target Tow Allocation	Usable Tows	Area (km^2)
South	50 - 125	27 - 68	26	30	5,334
	125 - 200	68 - 109	62	56	5,873
	200 - 330	109 - 164	28	30	3,134
	330 - 500	164 - 273	2	6	625
South Total			*118*	*122*	*14,966*
North	50 - 125	27 - 68	8	5	2,279
	125 - 200	68 - 109	42	39	4,926
	200 - 330	109 - 164	53	54	4,688
	330 - 500	164 - 273	19	19	1,343
North Total			*122*	*117*	*13,236*
Grand Total			***240***	***239***	**28,202**

Table 4. Mean warp length and scope by depth interval.

Depth (m)	Mean Warp (m)	Mean Warp (fa)	Mean Scope	Mean Depth (fa)
50 - 100	202	110	2.8	39
100 - 150	371	203	2.9	71
150 - 200	500	273	2.9	95
200 - 250	607	332	2.7	123
250 - 300	701	383	2.6	150
300 - 350	827	452	2.6	177
350 - 400	867	474	2.3	204
400 - 450	1052	575	2.5	232
450 - 500	905	495	1.9	263

Table 5. Summary of survey operations.

Start: Depart PBS	July 3
End: Offload PBS	August 10
Fishing days	28
Travel (begin and end)	3
Offload days	4
Weather days	2
Breakdown	1
Total days	38
Total tows	253
Keeper tows	239
Unusable tows	14
Inspected un-fished blocks	16
Tows per day overall	6.3
Usable tows per fishing day	8.5
Mean catch per keeper tow	377
Mean species per keeper tow	16

Table 6. Catch broken down by species groups.

Species Category	**Number of Taxa**	**Weight (Kg)**
All Fish	*107*	*95,909*
Rockfish	29	65,788
Flatfish	12	19,182
Roundfish	8	5,702
Cartilaginous fish	6	4,909
Other fish	52	327
Invertebrates	66	1,393

Table 7. All captured species showing number of tows in which the species occurred, total catch weight, maximum and mean per-tow catch weight, and relative abundance and relative error from bootstrapped area expanded estimates.

Species	Number of Tows	Catch Weight (kg) Total	Maximum	Mean	Relative Abundance	RE
Pacific ocean perch	190	39557.1	2719.9	211.5	27.418	0.13
Arrowtooth flounder	219	8683.0	613.4	39.8	6.837	0.11
Redstripe rockfish	56	4885.0	1931.5	88.8	3.457	0.56
Splitnose rockfish	28	4718.1	3729.7	168.5	3.025	0.74
Rex sole	213	3326.1	149.6	15.9	2.812	0.10
Silvergray rockfish	137	3147.7	201.8	23.1	2.970	0.15
Dover sole	179	2829.0	159.7	15.9	2.117	0.12
Yellowmouth rockfish	46	2692.3	494.2	58.5	1.963	0.34
Spiny dogfish	129	2183.9	523.7	16.9	3.137	0.40
Sablefish	139	1989.8	142.6	14.3	1.335	0.12
Pacific hake	92	1859.3	118.3	20.2	1.357	0.14
Shortspine thornyhead	112	1802.3	96.2	16.1	1.179	0.10
Redbanded rockfish	134	1703.4	186.4	12.8	1.231	0.16
Spotted ratfish	158	1649.5	1040.1	10.9	5.123	0.74
Rougheye rockfish	82	1587.6	613.1	20.6	1.167	0.40
Canary rockfish	45	1473.9	414.1	32.8	1.449	0.33
Sharpchin rockfish	51	1371.9	547.4	28.6	0.812	0.48
Yellowtail rockfish	35	1327.3	511.4	37.9	1.111	0.42
Pacific sanddab	36	969.3	180.0	28.5	1.316	0.28
English sole	80	946.7	96.8	11.8	1.305	0.24
Pacific cod	110	896.9	96.6	8.2	0.987	0.16
Flathead sole	84	793.0	99.6	9.7	0.643	0.19
Pacific halibut	47	729.2	103.4	15.5	0.910	0.24
Longnose skate	83	633.6	28.2	7.6	0.593	0.21
Lingcod	62	608.4	135.5	9.8	0.814	0.27
Southern rock sole	37	515.5	88.9	16.1	0.771	0.25
Sponges	63	501.2	315.1	8.8	-	-
Squids	77	450.0	67.6	6.6	-	-
Big skate	13	371.2	227.5	28.6	0.712	0.73
Walleye pollock	100	330.6	25.7	3.6	0.314	0.18
Yelloweye rockfish	26	315.2	96.8	12.1	0.280	0.38
Petrale sole	68	277.7	23.9	4.1	0.368	0.18
Widow rockfish	14	244.9	67.5	17.5	0.197	0.56
Darkblotched rockfish	25	214.4	98.0	8.9	0.160	0.51
Greenstriped rockfish	55	165.9	33.9	3.3	0.143	0.27
Bocaccio	12	156.7	94.5	13.1	0.148	0.59
Shortraker rockfish	9	154.0	42.5	17.1	0.083	0.39
Rosethorn rockfish	43	152.2	21.7	3.5	0.101	0.25
Slender sole	97	100.6	11.0	1.3	0.104	0.27
Jellyfish	62	91.3	6.4	1.8	-	-
Gorgonian corals	7	89.9	54.1	22.5	-	-
Blackbelly eelpout	69	79.0	22.3	1.7	0.063	0.36
Chub mackerel	1	74.7	74.7	74.7	0.121	0.95
Fragile urchin	89	72.5	18.0	1.2	-	-

Table 7. Continued

Species	Number of Tows	Catch Weight (kg) Total	Maximum	Mean	Relative Abundance	RE
Quillback rockfish	7	63.6	30.9	9.1	0.089	0.62
Eulachon	41	50.1	12.4	1.5	0.039	0.37
Chum salmon	3	47.0	30.5	15.7	0.042	0.73
Sandpaper skate	27	43.4	6.8	1.7	0.027	0.33
Sidestripe shrimp	61	31.4	5.9	0.7	-	-
Roughtail skate	4	27.2	8.9	6.8	0.018	0.52
Prawn	48	23.9	3.0	0.6	-	-
Neon flying squid	3	20.3	11.3	6.8	-	-
Anthozoa	4	18.7	13.7	4.7	-	-
Blackfin sculpin	29	18.7	3.3	0.8	0.011	0.29
Pygmy rockfish	7	16.7	11.8	2.8	0.024	0.83
Pink shrimp	49	15.0	2.9	0.5	-	-
Shortbelly rockfish	4	14.3	6.9	3.6	0.013	0.67
Giant pacific octopus	4	12.7	9.4	4.2	-	-
Pink shrimp (smooth)	19	12.5	5.9	1.0	-	-
Wolf eel	4	11.7	4.5	3.9	0.011	0.71
Pacific herring	35	10.7	1.8	0.4	0.010	0.28
Sea urchins	17	10.6	4.2	0.8	-	-
Bigmouth sculpin	3	10.3	4.8	3.4	0.010	0.57
Threadfin sculpin	23	9.5	3.4	0.6	0.011	0.37
Curlfin sole	12	9.3	1.8	0.8	0.013	0.31
Anemone	9	9.1	4.4	1.5	-	-
Sea cucumber	34	7.7	1.5	0.4	-	-
Pink salmon	5	7.1	2.0	1.8	0.004	0.49
Brown rockfish	3	7.0	2.9	2.3	0.006	0.62
Harlequin rockfish	4	5.9	3.3	1.5	0.002	0.80
Bigfin eelpout	9	5.1	2.4	0.7	0.008	0.52
Kelp greenling	2	4.6	4.0	2.3	0.007	0.88
Glass sponges	1	3.9	3.9	3.9	-	-
Brown irish lord	1	3.7	3.7	3.7	0.004	1.00
Box crabs	4	3.6	1.3	0.9	-	-
Aurora rockfish	3	3.4	1.4	1.1	0.000	0.96
Sea whip	16	3.2	1.8	0.6	-	-
Chilipepper	2	3.2	3.2	3.2	0.003	0.98
Eelpouts	8	2.3	1.4	0.4	-	-
Lithodes	3	2.3	1.3	1.2	-	-
Ascidians and tunicates	25	2.2	1.1	0.6	-	-
Butter sole	2	2.2	1.1	1.1	0.003	0.65
Dusky rockfish	1	2.0	2.0	2.0	0.002	1.04
Jack mackerel	2	1.9	1.7	1.0	0.003	1.03
Starfish	23	1.9	0.7	0.3	-	-
Blackgill rockfish	1	1.8	1.8	1.8	0.001	1.04
Cushion star	10	1.5	0.9	0.5	-	-

Table 7. Continued

Species	Number of Tows	Catch Weight (kg) Total	Maximum	Mean	Relative Abundance	RE
Basket stars	21	1.3	0.4	0.3	-	-
Northern lampfish	7	1.1	0.8	0.6	0.001	0.68
Pacific tomcod	3	1.1	0.8	0.6	0.001	0.67
Pink scallop	2	1.0	1.0	1.0	-	-
Black eelpout	5	1.0	0.8	0.3	0.001	0.85
Black rockfish	1	0.8	0.8	0.8	0.001	0.99
Spotfin sculpin	2	0.8	0.6	0.4	0.001	0.79
Pacific sand lance	7	0.7	0.6	0.4	0.001	0.82
Heart urchins	4	0.7	0.5	0.4	-	-
Sculpins	3	0.7	0.6	0.4	-	-
Oregontriton	7	0.6	0.3	0.2	-	-
Shrimp	2	0.6	0.4	0.3	-	-
Pacific bobtail squid	28	0.6	0.3	0.2	-	-
Octopus	2	0.5	0.4	0.3	-	-
Spiny red sea star	5	0.5	0.4	0.3	-	-
Scallop	3	0.4	0.3	0.2	-	-
Wattled eelpout	5	0.4	0.2	0.1	0.000	0.58
Pygmy poacher	3	0.4	0.4	0.4	0.000	1.01
Vermillion starfish	4	0.4	0.3	0.2	-	-
Sturgeon poacher	5	0.3	0.2	0.2	0.001	0.70
Shortfin eelpout	5	0.3	0.2	0.2	0.000	0.69
Opalescent inshore squid	1	0.3	0.3	0.3	-	-
Perches	1	0.3	0.3	0.3	-	-
Pacific red octopus	3	0.2	0.2	0.2	-	-
Blackfin poacher	6	0.2	0.2	0.2	0.000	0.92
Lanternfishes	3	0.2	0.2	0.2	-	-
Fish-eating star	3	0.2	0.2	0.2	-	-
Slim sculpin	2	0.2	0.2	0.2	0.000	0.98
Sunflower starfish	1	0.1	0.1	0.1	-	-
Sea pens	1	0.1	0.1	0.1	-	-
Solasteridae	1	0.1	0.1	0.1	-	-
Mud star	6	0.1	0.1	0.1	-	-
Hagfishes	1	0.1	0.1	0.1	-	-
Ribbon barracudina	3	0.1	0.1	0.1	0.000	0.95
Pearly prickleback	1	0.1	0.1	0.1	0.000	0.94
Poachers	3	0.1	0.1	0.1	-	-
Blacktail snailfish	3	0.1	0.1	0.1	0.000	0.99
Bristly crab	1	0.1	0.1	0.1	-	-
Cookie star	2	0.0	0.0	0.0	-	-
Green urchin	1	0.0	0.0	0.0	-	-
Blood star	1	0.0	0.0	0.0	-	-
Proboscisworm	1	0.0	0.0	0.0	-	-
Blacktip poacher	2	-	-	-	-	-
Rockfishes	1	-	-	-	-	-

Table 7. Continued

Species	Number of Tows	Catch Weight (kg) Total	Maximum	Mean	Relative Abundance	RE
Chitons	1	-	-	-	-	-
Phrynophiurida	12	-	-	-	-	-
Tubeshoulders	1	-	-	-	-	-
Viperfishes	2	-	-	-	-	-
Purple sea urchins	1	-	-	-	-	-
Ragfish	1	-	-	-	-	-
Long-armed sea star	6	-	-	-	-	-
Pacific staghorn sculpin	1	-	-	-	-	-
Sea lilies and feather stars	1	-	-	-	-	-
Bluespotted poacher	2	-	-	-	-	-
Isopods	2	-	-	-	-	-
Peanutworms	1	-	-	-	-	-
Giant red sea cucumber	1	-	-	-	-	-
Sea pen	2	-	-	-	-	-
California headlightfish	1	-	-	-	-	-
Arthropoda	1	-	-	-	-	-
Spinyhead sculpin	1	-	-	-	-	-
Roughback sculpin	1	-	-	-	-	-
Seaslugs	2	-	-	-	-	-
Northern ronquil	2	-	-	-	-	-
Pricklebacks	1	-	-	-	-	-
Gastropods	5	-	-	-	-	-
Coonstripe shrimp	2	-	-	-	-	-
Lampreys	1	-	-	-	-	-
Daubed shanny	1	-	-	-	-	-
Spike shrimp (horned shrimp)	1	-	-	-	-	-
Furrowed rock crab	2	-	-	-	-	-
Squat lobster	3	-	-	-	-	-
Northern spearnose poacher	1	-	-	-	-	-
Graceful decorator crab	8	-	-	-	-	-
Fish eggs	3	-	-	-	-	-
Pacific viperfish	3	-	-	-	-	-
Glass shrimp	1	-	-	-	-	-
Smalldisk snailfish	1	-	-	-	-	-
Rose starfish	3	-	-	-	-	-
Shining tubeshoulder	1	-	-	-	-	-
Sand star	1	-	-	-	-	-
Bigscales	1	-	-	-	-	-
Arminidae	1	-	-	-	-	-
Ribbed sculpin	1	-	-	-	-	-
Blue lanternfish	4	-	-	-	-	-
Right-handed hermits	1	-	-	-	-	-
Barracudinas	1	-	-	-	-	-

Table 8. Offloaded catch weight by species.

Species	Weight (kg)
Arrowtooth flounder	166.9
Bocaccio	13.6
Canary rockfish	74.4
Darkblotched rockfish	30.4
Dover sole	650.5
English sole	44.5
Flathead sole	10.4
Greenstriped rockfish	9.1
Lingcod	94.3
Pacific cod	77.1
Pacific ocean perch	25,187.5
Petrale sole	1.8
Redbanded rockfish	429.1
Redstripe rockfish	2,679.4
Rex sole	353.8
Rock sole	60.8
Rosethorn rockfish	3.2
Rougheye rockfish	1,031.9
Sharpchin rockfish	255.4
Shortraker rockfish	54.4
Shortspine thornyhead	533.4
Silvergray rockfish	482.2
Splitnose rockfish	2,819.5
Walleye pollock	5.9
Widow rockfish	12.7
Yelloweye rockfish	4.1
Yellowmouth rockfish	1,808.0
Yellowtail rockfish	582.0
Total	**37,476.3**

Table 9. Number of samples and number of recorded biological attributes per species sampled.

Species	Samples	Length	Weight	Sex	Maturity	Age
Arrowtooth flounder	95	3,485	1,118	3,485	1,114	1,118
Aurora rockfish	3	6	6	6	6	6
Big skate	12	49	0	49	0	0
Bocaccio	10	38	38	38	38	38
Canary rockfish	11	324	323	324	323	322
Chub mackerel	1	25	25	25	0	25
Chum salmon	1	7	7	7	0	0
Curlfin sole	3	6	4	6	4	4
Darkblotched rockfish	13	87	87	88	88	88
Dover sole	56	1,720	684	1,720	684	683
Dusky rockfish	1	1	1	1	1	1
English sole	29	1,178	642	1,179	642	595
Eulachon	3	329	0	0	0	0
Flathead sole	30	1,097	385	1,097	385	384
Greenstriped rockfish	43	340	321	340	320	319
Lingcod	59	194	193	194	193	193
Longnose skate	72	112	0	111	0	0
Pacific cod	103	1,389	833	1,389	833	77
Pacific hake	7	191	178	191	178	178
Pacific halibut	44	108	0	108	0	0
Pacific ocean perch	104	4,051	3,205	4,039	3,200	3,193
Pacific sand lance	1	50	0	0	0	0
Pacific sanddab	13	624	229	624	229	229
Pacific tomcod	1	6	0	6	0	0
Petrale sole	64	386	381	386	380	381
Pink salmon	1	1	0	1	0	0
Pygmy rockfish	1	100	100	100	100	100
Quillback rockfish	6	61	31	61	31	31
Redbanded rockfish	124	959	959	959	959	960
Redstripe rockfish	18	838	485	671	484	485
Rex sole	88	3,742	973	3,743	974	934
Rosethorn rockfish	33	387	369	387	368	369
Rougheye rockfish	53	409	391	410	392	393
Roughtail skate	4	4	0	4	0	0
Sablefish	24	569	435	569	435	435
Sandpaper skate	24	31	0	31	0	0
Sharpchin rockfish	16	627	279	627	278	279
Shortraker rockfish	8	27	27	27	27	27
Shortspine thornyhead	55	2,153	833	2,152	832	833
Silvergray rockfish	25	546	456	545	455	456
Slender sole	9	417	114	417	114	114
Southern rock sole	16	454	351	453	350	319
Spiny dogfish	11	430	0	430	0	0
Splitnose rockfish	11	402	319	402	319	319
Spotted ratfish	20	1,044	0	1,044	0	0
Threadfin sculpin	1	6	0	6	0	0
Walleye pollock	19	655	254	637	254	155
Widow rockfish	6	109	109	109	109	109
Yelloweye rockfish	22	81	81	81	80	81
Yellowmouth rockfish	26	615	615	615	615	615
Yellowtail rockfish	10	276	231	276	231	231
Total	**1,410**	**30,746**	**16,072**	**30,170**	**16,025**	**15,079**

Table 10. Numbers of samples and specimens by sample type and species.

Species	Total		Len./Sex		Len./Sex/Wt.		Len./Sex/Wt./Age	
	N	n	N	n	N	n	N	n
Arrowtooth flounder	95	3,485	65	2,367	0	0	30	1,118
Aurora rockfish	3	6	0	0	0	0	3	6
Big skate	12	49	12	49	0	0	0	0
Bocaccio	10	38	0	0	0	0	10	38
Canary rockfish	11	323	1	1	0	0	10	322
Chub mackerel	1	25	0	0	0	0	1	25
Chum salmon	1	7	0	0	1	7	0	0
Curlfin sole	3	6	1	2	0	0	2	4
Darkblotched rockfish	13	88	0	0	0	0	13	88
Dover sole	56	1,719	38	1,036	0	0	18	683
Dusky rockfish	1	1	0	0	0	0	1	1
English sole	29	1,177	15	537	1	45	13	595
Eulachon	3	329	3	329	0	0	0	0
Flathead sole	30	1,096	20	712	0	0	10	384
Greenstriped rockfish	43	339	1	19	1	1	41	319
Lingcod	59	194	1	1	0	0	58	193
Longnose skate	72	112	72	112	0	0	0	0
Pacific cod	103	1,389	37	556	64	756	2	77
Pacific hake	7	191	1	13	0	0	6	178
Pacific halibut	44	108	44	108	0	0	0	0
Pacific ocean perch	104	4,039	27	846	0	0	77	3,193
Pacific sand lance	1	50	1	50	0	0	0	0
Pacific sanddab	13	624	8	395	0	0	5	229
Pacific tomcod	1	6	1	6	0	0	0	0
Petrale sole	64	386	2	5	0	0	62	381
Pink salmon	1	1	1	1	0	0	0	0
Pygmy rockfish	1	100	0	0	0	0	1	100
Quillback rockfish	6	61	1	30	0	0	5	31
Redbanded rockfish	124	959	0	0	0	0	124	959
Redstripe rockfish	18	838	7	353	0	0	11	485
Rex sole	88	3,743	64	2,769	1	40	23	934
Rosethorn rockfish	33	387	1	18	0	0	32	369
Rougheye rockfish	53	411	1	18	0	0	52	393
Roughtail skate	4	4	4	4	0	0	0	0
Sablefish	24	569	7	134	0	0	17	435
Sandpaper skate	24	31	24	31	0	0	0	0
Sharpchin rockfish	16	627	8	348	0	0	8	279
Shortraker rockfish	8	27	0	0	0	0	8	27
Shortspine thornyhead	55	2,153	32	1,320	0	0	23	833
Silvergray rockfish	25	546	3	90	0	0	22	456
Slender sole	9	417	6	303	0	0	3	114
Southern rock sole	16	454	4	103	1	32	11	319
Spiny dogfish	11	430	11	430	0	0	0	0
Splitnose rockfish	11	402	2	83	0	0	9	319
Spotted ratfish	20	1,044	20	1,044	0	0	0	0
Threadfin sculpin	1	6	1	6	0	0	0	0
Walleye pollock	19	655	11	401	1	99	7	155
Widow rockfish	6	109	0	0	0	0	6	109
Yelloweye rockfish	22	81	0	0	0	0	22	81
Yellowmouth rockfish	26	615	0	0	0	0	26	615
Yellowtail rockfish	10	276	2	45	0	0	8	231
Total	**1,410**	**30,733**	**560**	**14,675**	**70**	**980**	**780**	**15,078**

Table 11. Statistics of individual length and weight, and sex proportion by species.

	Length (cm)			Weight (kg)			Sex Proportion	
Species	**Min.**	**Max.**	**Mean**	**Min.**	**Max.**	**Mean**	**Male**	**Female**
Arrowtooth flounder	11.2	80.7	31.2	0.02	4.93	0.47	0.43	0.57
Aurora rockfish	23.6	39.2	31.4	0.21	0.98	0.55	0.67	0.33
Big skate	19.0	129.0	79.7	0.04	0.04	0.04	0.49	0.51
Bocaccio	53.2	79.4	66.2	1.88	5.66	3.67	0.74	0.26
Canary rockfish	28.4	63.4	47.9	0.39	4.26	2.03	0.61	0.39
Chub mackerel	51.6	61.0	55.8	1.65	2.39	1.88	0.43	0.57
Chum salmon	52.2	70.2	65.1	3.27	5.47	4.28	0.57	0.43
Curlfin sole	25.1	33.5	28.7	0.22	0.60	0.38	0.67	0.33
Darkblotched rockfish	29.4	51.0	40.0	0.49	2.52	1.18	0.55	0.45
Dover sole	19.0	62.5	37.4	0.11	2.42	0.64	0.64	0.36
Dusky rockfish	49.5	49.5	49.5	1.98	1.98	1.98	1.00	0.00
English sole	10.0	50.5	30.4	0.07	1.45	0.28	0.42	0.58
Eulachon	9.0	21.0	16.7				0.00	0.00
Flathead sole	11.5	41.0	27.6	0.01	0.62	0.19	0.46	0.54
Greenstriped rockfish	12.0	44.0	29.5	0.02	0.84	0.37	0.49	0.51
Lingcod	44.3	105.8	66.4	0.91	12.08	3.01	0.26	0.74
Longnose skate	36.0	135.0	86.4	1.14	8.32	4.31	0.44	0.54
Pacific cod	5.8	83.8	33.8	0.06	6.73	0.55	0.51	0.49
Pacific hake	27.5	78.5	52.2	0.48	2.43	0.91	0.39	0.61
Pacific halibut	47.0	135.0	73.6	8.45	8.45	8.45	0.70	0.30
Pacific ocean perch	8.9	83.2	37.6	0.01	2.06	0.90	0.52	0.48
Pacific sand lance	12.0	18.0	14.5				0.00	0.00
Pacific sanddab	8.6	31.0	23.2	0.02	0.33	0.12	0.48	0.52
Pacific tomcod	24.0	26.0	25.1				0.83	0.17
Petrale sole	26.1	59.5	38.6	0.16	2.78	0.69	0.59	0.41
Pink salmon	52.0	52.0	52.0				0.00	1.00
Pygmy rockfish	9.0	20.5	13.2	0.01	0.07	0.03	0.36	0.64
Quillback rockfish	21.0	49.2	36.1	0.39	1.64	1.19	0.41	0.59
Redbanded rockfish	13.4	64.4	41.4	0.04	5.33	1.44	0.49	0.51
Redstripe rockfish	9.0	82.9	26.9	0.02	0.97	0.37	0.42	0.38
Rex sole	13.0	45.0	29.9	0.02	0.47	0.19	0.62	0.38
Rosethorn rockfish	9.4	50.0	27.0	0.01	0.69	0.28	0.49	0.51
Rougheye rockfish	10.9	71.4	42.5	0.03	6.00	1.45	0.52	0.48
Roughtail skate	93.3	106.4	101.9				0.50	0.50
Sablefish	32.0	97.8	53.2	0.40	5.90	1.65	0.62	0.38
Sandpaper skate	17.0	109.0	53.7	0.85	0.92	0.89	0.48	0.52
Sharpchin rockfish	5.3	40.0	28.0	0.01	1.10	0.34	0.43	0.57
Shortraker rockfish	44.7	139.0	65.8	1.68	19.87	5.41	0.37	0.63
Shortspine thornyhead	10.5	77.5	27.6	0.01	2.20	0.31	0.50	0.50
Silvergray rockfish	32.5	67.0	51.6	0.50	3.75	1.90	0.69	0.31
Slender sole	10.9	32.0	22.9	0.01	0.21	0.08	0.44	0.56
Southern rock sole	10.0	57.0	29.7	0.03	2.71	0.51	0.41	0.59
Spiny dogfish	38.0	99.0	65.0				0.60	0.40
Splitnose rockfish	11.0	42.5	26.1	0.05	0.96	0.34	0.53	0.47
Spotted ratfish	9.0	66.0	32.5				0.43	0.57
Threadfin sculpin	21.0	27.0	23.0				0.33	0.67
Walleye pollock	10.2	53.0	26.9	0.04	1.17	0.25	0.49	0.48
Widow rockfish	23.5	56.3	42.7	0.20	2.92	1.45	0.55	0.45
Yelloweye rockfish	37.7	71.4	54.1	0.89	7.32	3.25	0.53	0.47
Yellowmouth rockfish	28.2	55.3	44.6	0.47	2.35	1.43	0.62	0.38
Yellowtail rockfish	24.0	54.7	43.1	0.32	2.55	1.58	0.47	0.53

Table 12. Data collected from net sensors, showing the number of tows from which each data type was collected (total number of survey tows is 253).

Sensor	Attribute	Num. Tows	Num. Records
Furuno Depth Sounder (Unknown Model)	Bottom Depth	239	1,115
Global Positioning System (Gps)	Vessel Position - Latitude	236	485,902
Global Positioning System (Gps)	Vessel Position - Longitude	236	485,902
NMFS Bottom Contact Sensor	Bottom Contact Sensor Tilt Angle	252	86,227
Nobeltec Nautical Software	Vessel Speed Over Ground	245	1,143
Scanmar Cgm Rx 400	Cross-Current Water Velocity At Net Depth	226	456,295
Scanmar Cgm Rx 400	Net Depth	74	144,501
Scanmar Cgm Rx 400	Trawl Net Doorspread	236	465,400
Scanmar Cgm Rx 400	Trawl Net Footrope To Headline Distance	207	428,339
Scanmar Cgm Rx 400	Water Temperature At Net Depth	106	209,278
Scanmar Cgm Rx 400	Water Velocity At Net Depth	226	456,329
Scantrawl Autotrawl System	Warp Length	199	930
Seabird Sbe39 Temperature And Pressure Sensor	Net Depth	233	48,397
Seabird Sbe39 Temperature And Pressure Sensor	Water Temperature At Net Depth	233	48,397
Unknown Or Not Applicable	Water Temperature At Surface	96	455

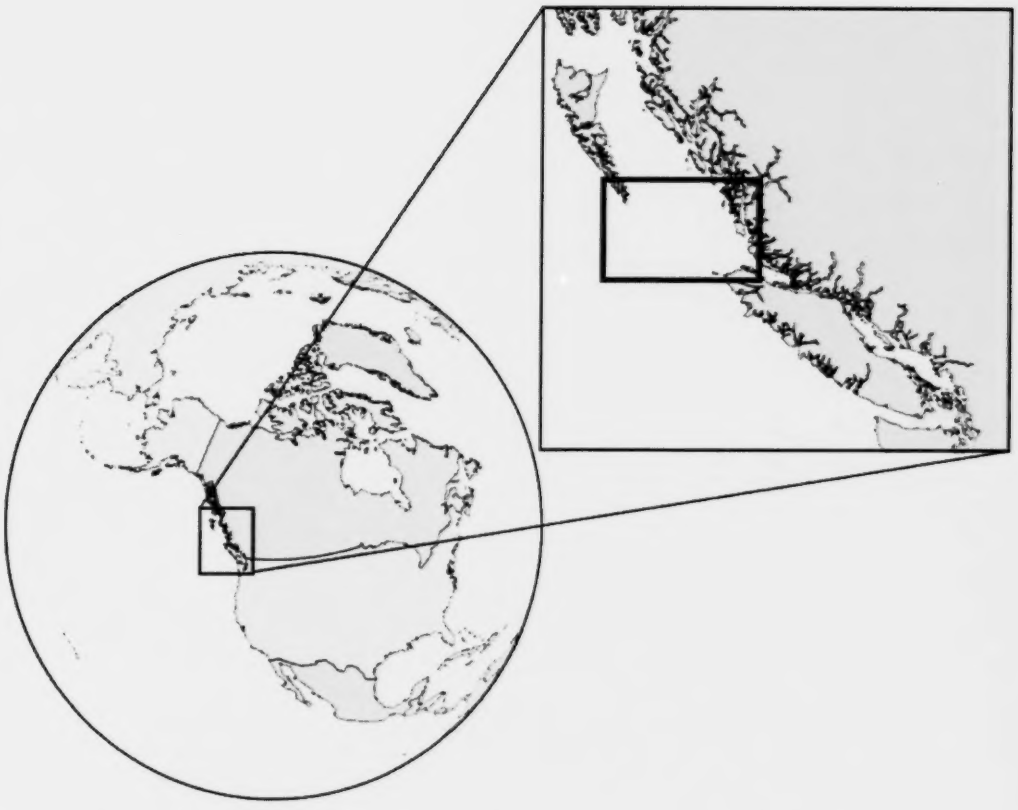

Figure 1. Location of Queen Charlotte Sound on the coast of British Columbia, Canada.

Figure 2. The commercial stern trawler F/V Viking Storm.

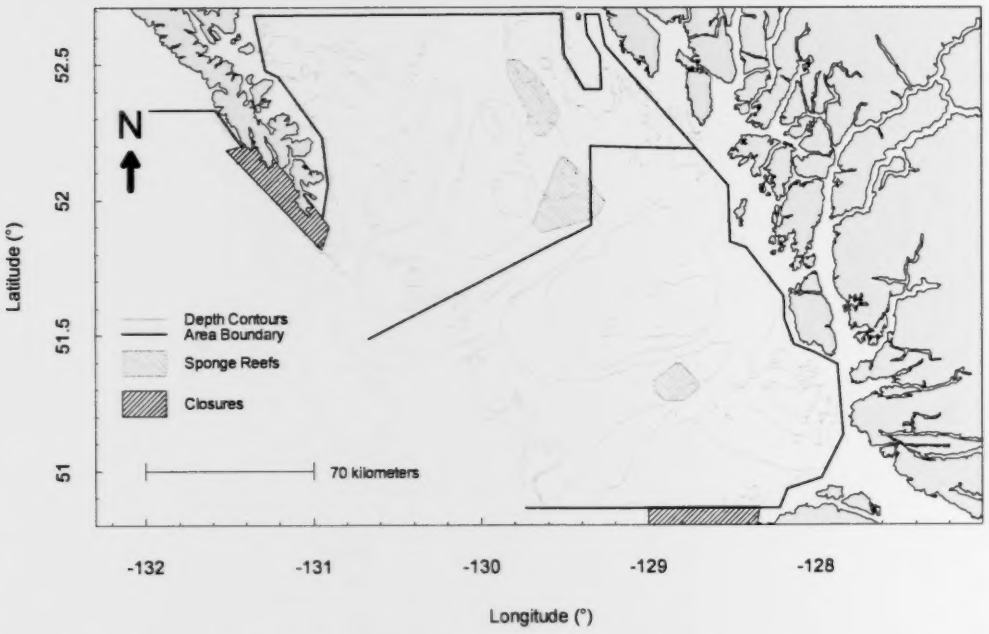

Figure 3. The Queen Charlotte Sound study area showing area boundary, fishing closures, sponge reef protected areas, and depth contours.

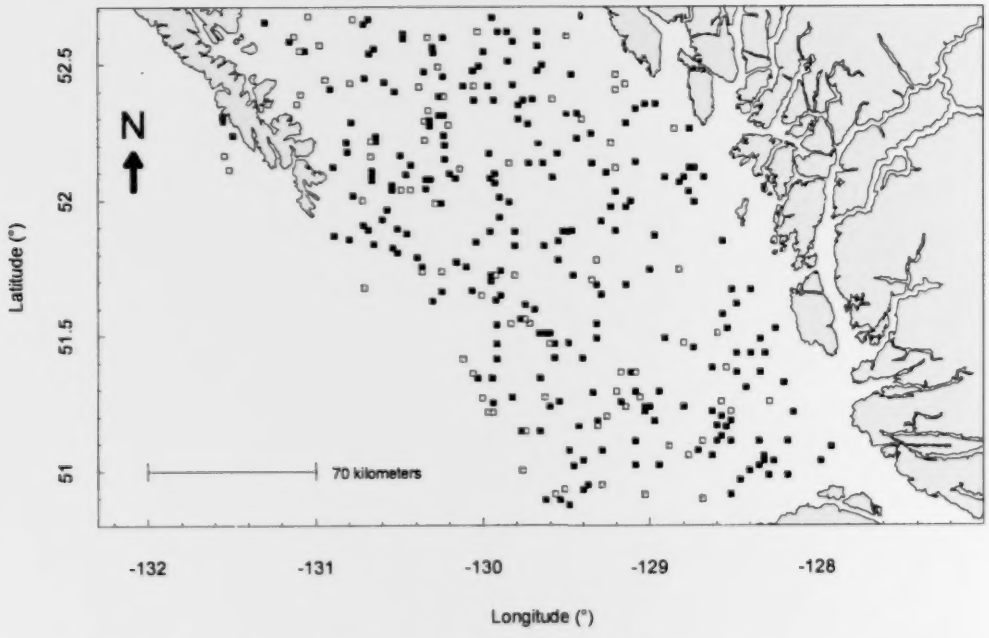

Figure 4. Initial status of the sampling frame showing the 240 primary fishing locations (dark squares) and 80 secondary locations (light squares).

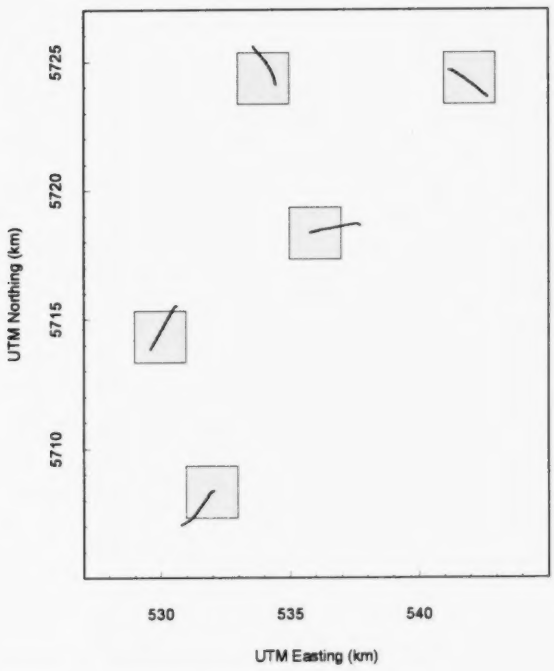

Figure 5. Example tow tracks from 2003.

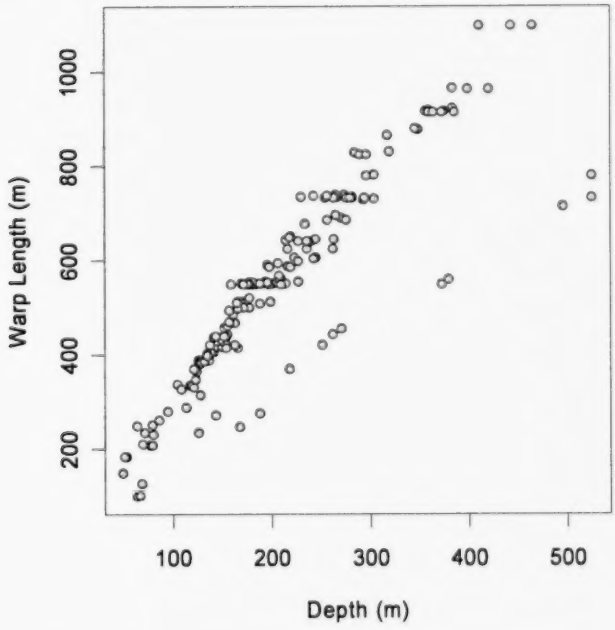

Figure 6. Warp length versus starting depth.

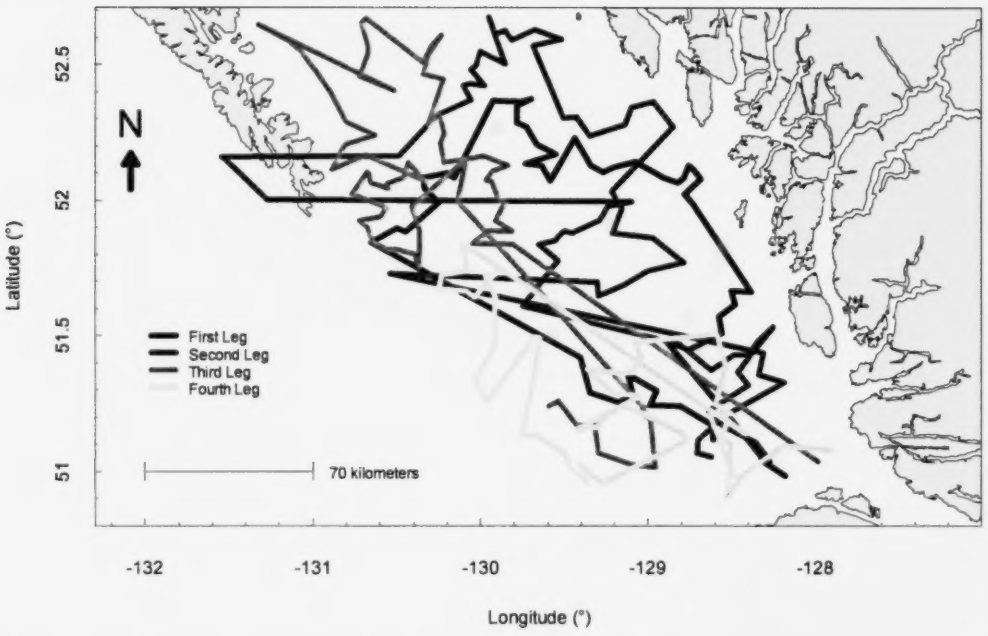

Figure 7. Locations visited in each leg of the survey.

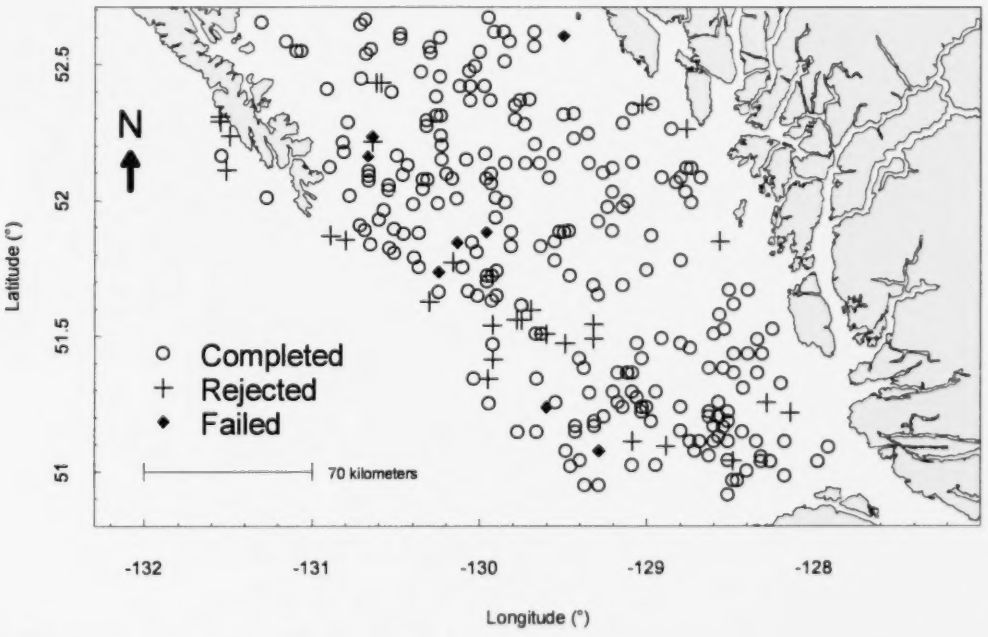

Figure 8. Final status of the sampling frame showing locations that were fished successfully (completed), rejected prior to fishing (rejected), or abandoned after one or more unsuccessful fishing attempts (failed).

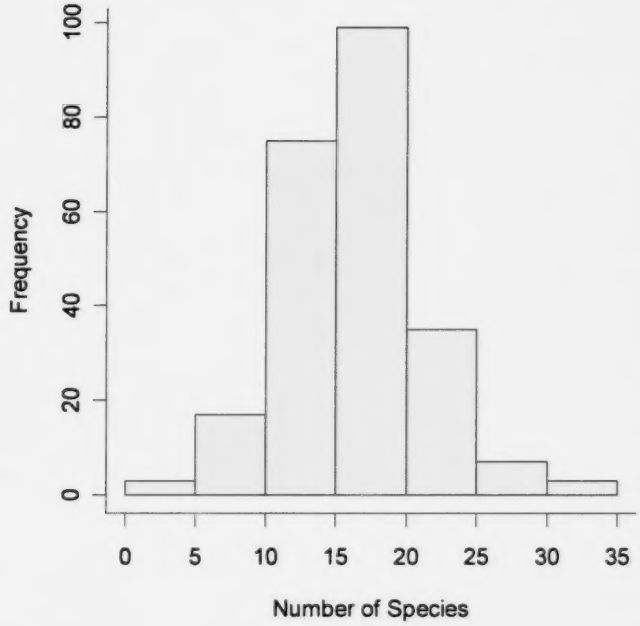

Figure 9. Histogram of number of species caught per tow.

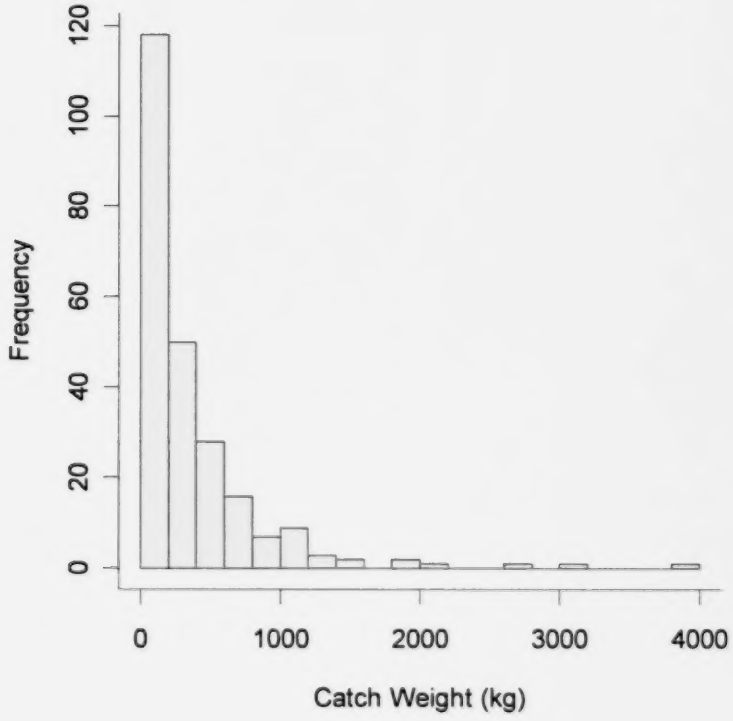

Figure 10. Histogram of catch weight per tow.

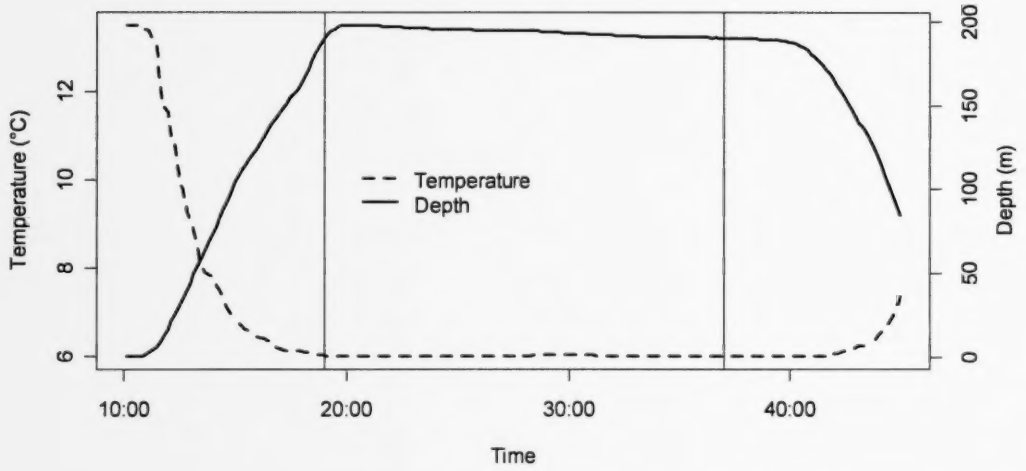

Figure 11. Seabird 39 temperature and depth profile from set number 15. The vertical lines indicate the start and end of net contact with the sea floor.

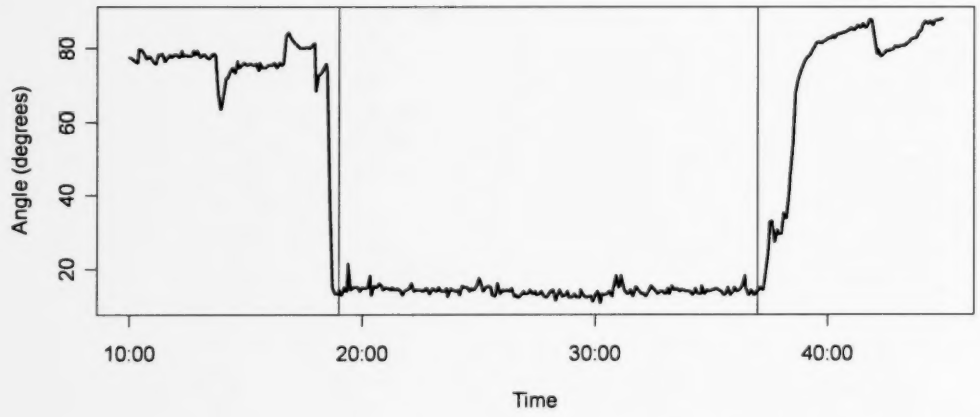

Figure 12. NMFS bottom contact sensor profile from set number 15. The dashed vertical lines indicate the start and end of net contact with the sea floor. Note the highly variable angular reading between the start and end, which indicates a very rough sea floor.

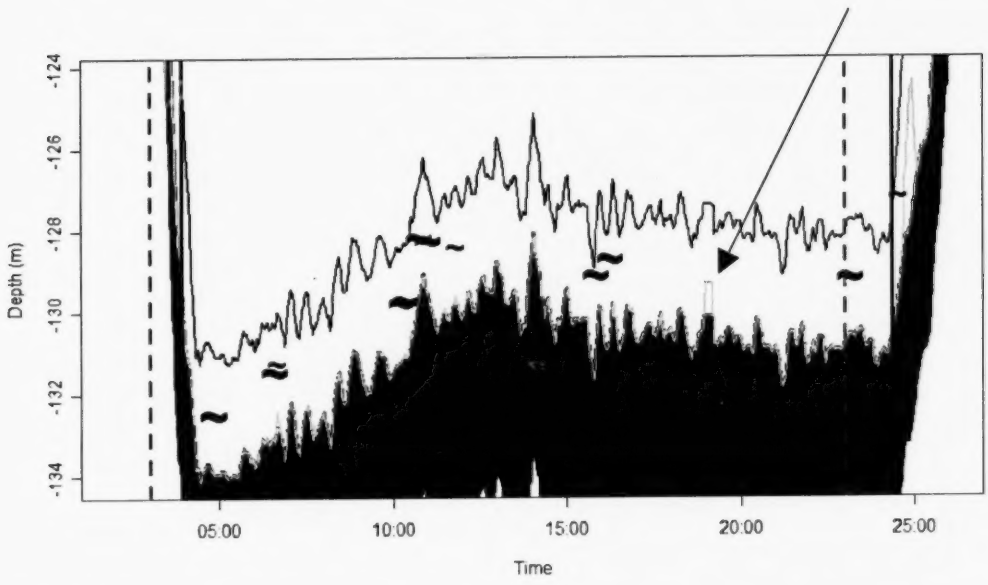

Figure 13. Example plot of net sensor data. The solid dark area at the bottom represents the sea floor. The light grey line directly above that represents the net footrope (note the region indicated by the arrow, showing where the net has risen off the sea floor for a brief period). The top line indicates the net headrope. The symbols between the headrope and the footrope indicate where fish have entered the net.

APPENDIX A: BRIDGE LOG

Tow	Date	Time	Latitude	Longitude	Depth (m)	Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable?
1	Jul 04	17:59	50.9865	128.1805	80	24	4.8	251	509.8	Yes
2	Jul 04	19:32	51.0407	128.3140	140	21	5.4	430	264.0	Yes
3	Jul 04	20:36	51.0612	128.3293	158	24	4.5	549	323.7	Yes
4	Jul 05	08:08	51.4857	128.9002	64	21	6.7	249	351.9	Yes
5	Jul 05	09:40	51.4490	128.7567	181	22	5.6	549	3175.2	Yes
6	Jul 05	11:29	51.5127	128.5600	182	22	5.3	549	557.6	Yes
7	Jul 05	12:50	51.5712	128.5758	150	21	6.0	457	140.2	Yes
8	Jul 05	13:55	51.6150	128.4832	152	22	6.3	439	206.3	Yes
9	Jul 05	15:12	51.6652	128.5013	141	20	5.9	437	291.4	Yes
10	Jul 05	16:45	51.6610	128.3822	144	20	6.1	439	121.0	Yes
11	Jul 05	21:12	51.9853	128.7280	166	22	5.6	497	676.6	Yes
12	Jul 06	07:21	52.0248	128.7825	177	21	6.4	552	105.6	Yes
13	Jul 06	08:36	52.0797	128.6858	207	21	6.0	593	450.0	Yes
14	Jul 06	09:37	52.1148	128.7300	196	20	5.5	589	36.8	Yes
15	Jul 06	10:37	52.1272	128.7593	194	18	6.2	550	27.5	Yes
16	Jul 06	11:39	52.0840	128.7885	181	20	5.9	552	57.9	Yes
17	Jul 06	12:49	52.0658	128.8180	176	20	5.5	519	56.2	Yes
18	Jul 06	13:47	52.0833	128.9033	177	22	5.4	549	65.8	Yes
19	Jul 06	15:38	52.1430	129.0762	135	20	6.3	397	63.3	Yes
20	Jul 06	17:02	52.1227	129.2070	163	19	5.9	466	114.1	Yes
21	Jul 06	18:19	52.1027	129.2710	170	22	6.4	550	158.7	Yes
22	Jul 06	19:32	52.1300	129.3412	176	22	5.6	550	189.1	Yes
23	Jul 06	21:20	52.2318	129.4372	15?	20	6.1	494	146.0	Yes
24	Jul 07	07:28	52.0713	129.5860	2?4	19	6.3	642	42.1	Yes
25	Jul 07	08:40	52.1292	129.6397	220	19	6.2	651	82.1	Yes
26	Jul 07	10:00	52.1350	129.7347	201	20	6.2	585	33.0	Yes
27	Jul 07	11:39	52.1712	129.5532	216	21	5.7	649	276.2	Yes
28	Jul 07	13:00	52.2055	129.6677	216	20	5.6	625	32.8	Yes
29	Jul 07	14:08	52.2738	129.7262	205	20	5.3	552	639.0	Yes
30	Jul 07	15:36	52.2875	129.7833	201	19	5.6	549	85.0	Yes
31	Jul 07	16:57	52.3490	129.7863	212	21	5.8	550	83.9	Yes
32	Jul 07	18:35	52.3732	129.6982	210	19	5.4	549	207.9	Yes
33	Jul 07	19:42	52.3632	129.7558	220	20	6.0	585	141.5	Yes
34	Jul 07	21:01	52.3673	129.9272	196	19	4.5	512	43.1	Yes
35	Jul 08	07:23	52.0843	130.1590	254	21	5.9	732	226.2	Yes
36	Jul 08	08:28	52.0997	130.1982	296	22	6.2	823	44.6	Yes
37	Jul 08	10:01	52.0847	130.3397	412	24	5.9	1097	236.1	Yes
38	Jul 08	11:20	52.0447	130.3370	386	20	5.8	914	163.8	Yes
39	Jul 08	12:58	51.9913	130.2487	282	19	6.3	732	75.4	Yes
40	Jul 08	14:47	51.8828	130.4460	267	17	5.4	732	230.0	Yes
41	Jul 08	16:02	51.8958	130.5010	364	19	5.7	914	147.4	Yes
42	Jul 08	17:37	51.8462	130.6512		21	5.1	914	1022.4	No
43	Jul 09	07:25	51.4207	129.4043	126	20	5.7	234	112.4	Yes
44	Jul 09	09:16	51.2918	129.3502	282	20	5.7	732	180.3	Yes
45	Jul 09	10:59	51.2543	129.1728	263	20	6.1	732	756.3	Yes
46	Jul 09	12:10	51.2902	129.0903	256	21	6.1	737	603.1	Yes

Tow	Date	Time	Latitude	Longitude	Depth (m)	Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable?
47	Jul 09	13:45	51.3577	129.1233	227	19	6.0	640	642.2	Yes
48	Jul 09	15:25	51.2972	128.9540	234	18	6.0	640	847.8	Yes
49	Jul 09	16:35	51.2430	128.9925	201	16	6.1	550	111.9	Yes
50	Jul 09	18:18	51.2398	128.8088	199	17	6.2	549	262.7	Yes
51	Jul 09	20:00	51.1717	128.6148	163	19	6.2	421	282.5	Yes
52	Jul 09	21:06	51.1167	128.6132	124	19	5.9	366	157.3	Yes
53	Jul 11	07:27	51.0558	128.6223	81	19	5.5	233	150.8	Yes
54	Jul 11	08:32	51.0707	128.7045	67	21	5.4	229	62.8	Yes
55	Jul 11	09:27	51.1143	128.7015	72	20	6.4	235	232.5	Yes
56	Jul 11	15:01	51.1975	128.5592	196	21	5.9	552	486.1	Yes
57	Jul 11	18:09	51.3278	128.1875	76	20	5.2	208	84.4	Yes
58	Jul 11	19:28	51.3563	128.3360	123	20	5.7	348	177.1	Yes
59	Jul 11	20:51	51.4387	128.3102	114	19	6.2	288	170.2	Yes
60	Jul 12	07:17	51.7270	130.5378	87	20	5.7	260	152.9	Yes
61	Jul 12	08:50	51.6958	129.3025	53	21	4.3	183	770.7	Yes
62	Jul 12	10:06	51.6463	129.2988	49	20	7.1	149	544.9	Yes
63	Jul 12	11:05	51.6870	129.1518	52	21	7.0	183	104.1	Yes
64	Jul 12	12:19	51.7400	129.0037	79	19	6.3	207	96.0	Yes
65	Jul 12	13:48	51.7718	128.7863	70	21	5.9	209	11.5	Yes
66	Jul 12	15:40	51.8625	128.9750	94	21	6.1	280	174.0	Yes
67	Jul 12	17:29	51.8787	129.2100	120	22	6.1	370	73.6	Yes
68	Jul 12	18:47	51.9698	129.1570	188	21	5.9	551	217.1	Yes
69	Jul 12	20:22	52.0345	129.2180	173	22	6.1	550	140.9	Yes
70	Jul 13	08:49	52.2730	128.8475	181	25	5.2	550	105.2	Yes
71	Jul 13	11:13	52.3632	128.9675	116	21	5.1	327	161.6	Yes
72	Jul 13	13:01	52.3428	129.1007	156	20	5.7	460	152.7	Yes
73	Jul 13	14:44	52.2808	129.1375	157	20	5.9	467	96.6	Yes
74	Jul 13	16:43	52.2383	129.3490	143	21	5.5	420	215.8	Yes
75	Jul 13	17:58	52.3070	129.4270	163	21	5.1	510	268.3	Yes
76	Jul 13	19:12	52.3028	129.5060	185	20	6.0	551	57.7	Yes
77	Jul 14	08:14	52.5722	129.6872	154	21	5.3	440	226.6	Yes
78	Jul 14	10:25	52.5952	129.5165	127	14	6.0	323	22.9	No
79	Jul 14	12:13	52.6305	129.6753	170	21	5.0	505	239.4	Yes
80	Jul 14	14:19	52.5927	129.8155	148	20	5.3	466	949.4	Yes
81	Jul 14	17:09	52.6253	129.8505	180	20	6.2	502	193.5	Yes
82	Jul 14	18:12	52.6118	129.9107	262	20	5.3	594	51.2	Yes
83	Jul 14	19:32	52.6772	129.9483	262	21	5.8	443	66.0	Yes
84	Jul 15	07:25	52.5057	129.8538	223	21	5.3	605	193.5	Yes
85	Jul 15	09:00	52.5505	129.9993	271	23	5.6	688	42.7	Yes
86	Jul 15	10:01	52.4977	130.0277	267	20	5.5	694	42.1	Yes
87	Jul 15	10:58	52.4822	130.0545	271	22	5.1	783	32.5	Yes
88	Jul 15	12:22	52.4250	129.9773	245	20	5.0	614	71.7	Yes
89	Jul 15	13:38	52.4287	130.0645	282	23	4.9	735	43.2	Yes
90	Jul 15	15:01	52.4223	130.1000	296	23	5.8	796	47.3	Yes
91	Jul 15	16:21	52.3723	130.0575	267	22	5.5	736	81.6	Yes
92	Jul 15	18:09	52.3132	130.2570	375	21	6.1	918	207.8	Yes
93	Jul 15	19:26	52.2760	130.3173	384	20	6.3	922	133.1	Yes
94	Jul 15	21:13	52.1638	130.4895	278	19	5.9	693	62.1	Yes

Tow	Date	Time	Latitude	Longitude	Depth (m)	Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable?
95	Jul 16	09:10	52.1608	131.5412	313	16	5.6	737	184.6	No
96	Jul 16	10:08	52.1572	131.5347	298	19	5.7	658	188.6	No
97	Jul 16	12:29	52.1592	131.5398	298	20	6.4	723	162.2	Yes
98	Jul 16	15:23	52.0025	131.2713	256	21	5.7	691	1145.9	Yes
99	Jul 17	20:48	51.9967	129.0998	180	22	6.0	551	137.5	Yes
100	Jul 18	06:30	51.9788	129.2413	182	21	6.3	551	118.9	Yes
101	Jul 18	07:30	51.9242	129.2897	198	20	6.3	551	458.3	Yes
102	Jul 18	08:56	51.8803	129.4557	236	20	6.4	642	374.8	Yes
103	Jul 18	09:53	51.8853	129.4967	240	20	6.2	646	332.8	Yes
104	Jul 18	10:54	51.8793	129.5172	243	24	6.4	737	498.8	Yes
105	Jul 18	11:55	51.8520	129.5585	265	20	6.5	739	499.9	Yes
106	Jul 18	13:20	51.8382	129.6555	285	21	5.9	828	200.4	Yes
107	Jul 18	14:50	51.7780	129.5397	230	23	5.7	735	173.0	Yes
108	Jul 18	17:25	51.6092	129.7502	166	18	5.7	409	2041.2	Yes
109	Jul 19	06:35	51.4688	128.8077	104	20	5.7	336	230.3	Yes
110	Jul 19	08:16	51.3733	128.6248	210	20	6.1	561	576.0	Yes
111	Jul 19	09:32	51.4298	128.4838	194	18	6.3	555	131.0	Yes
112	Jul 19	10:44	51.4302	128.4017	166	21	6.5	510	255.9	Yes
113	Jul 19	11:47	51.4833	128.3395	172	19	6.5	511	239.1	Yes
114	Jul 19	15:06	51.5307	128.2538	108	19	5.8	326	111.5	Yes
115	Jul 19	17:53	51.3665	128.4645	168	21	5.7	511	325.6	Yes
116	Jul 20	07:13	51.3167	128.4000	117	21	5.8	334	73.0	Yes
117	Jul 20	09:03	51.2232	128.6388	190	22	5.6	550	1231.6	Yes
118	Jul 20	11:39	51.1662	128.5500	176	22	5.7	549	536.3	Yes
119	Jul 20	13:12	51.1093	128.3548	183	21	6.0	549	595.7	Yes
120	Jul 20	14:32	51.0387	128.2687	148	21	6.5	421	256.1	Yes
121	Jul 21	19:30	51.0387	127.9820	145	20	6.3	415	453.3	Yes
122	Jul 22	06:26	51.8367	129.8072	234	21	5.6	677	488.1	Yes
123	Jul 22	08:23	51.8402	130.0483	178	19	6.1	501	682.4	Yes
124	Jul 22	10:01	51.8875	129.9528	120	1			3.8	No
125	Jul 22	11:41	51.8870	129.8115	142	19	6.4	408	188.5	Yes
126	Jul 22	13:09	51.9253	129.9103	132	20	5.9	387	86.9	Yes
127	Jul 22	14:24	51.9963	129.8515	118	18	6.0	336	1094.9	Yes
128	Jul 22	15:54	52.0005	129.8880	121	20	5.9	331	58.4	Yes
129	Jul 22	17:05	52.0700	129.9347	127	20	5.9	387	28.2	Yes
130	Jul 22	18:17	52.0755	129.9643	142	20	6.5	414	69.0	Yes
131	Jul 22	19:03	52.1070	129.9260	144	21	5.3	428	45.1	Yes
132	Jul 22	20:18	52.1282	129.8375	162	21	5.7	485	251.0	Yes
133	Jul 23	06:29	52.1625	129.9782	152	21	5.7	440	102.2	Yes
134	Jul 23	08:35	52.1403	130.2178	357	21	5.7	917	235.8	Yes
135	Jul 23	10:03	52.2140	130.2387	443	24	5.4	1097	119.1	Yes
136	Jul 23	11:47	52.2475	130.2173	464	22	5.6	1098	166.2	Yes
137	Jul 23	13:45	52.3213	130.2442	373	21	5.2	915	153.0	Yes
138	Jul 23	15:31	52.2810	130.3133	384	21	5.6	963	155.8	Yes
139	Jul 23	17:00	52.3755	130.2633	349	21	5.9	875	130.4	Yes
140	Jul 23	18:14	52.4472	130.2227	320	22	5.9	829	30.5	Yes
141	Jul 23	19:25	52.4650	130.3412	243	19	6.3	642	673.3	Yes
142	Jul 23	20:27	52.5342	130.3097	227	19	6.3	598	1111.0	Yes

Tow	Date	Time	Latitude	Longitude	Depth (m)	Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable?
143	Jul 24	06:41	52.6075	130.2322	256	21	5.2	686	71.0	Yes
144	Jul 24	07:43	52.5685	130.2927	245	20	5.8	644	270.2	Yes
145	Jul 24	09:42	52.5067	130.3402	150	19	6.6	429	480.8	Yes
146	Jul 24	10:40	52.5067	130.3402	153	20	6.4	421	73.3	Yes
147	Jul 24	12:33	52.6728	130.6795	135	19	6.5	390	395.0	Yes
148	Jul 24	13:30	52.6543	130.7082	131	20	5.9	384	194.1	Yes
149	Jul 24	14:46	52.5672	130.6700	138	20	6.0	389	117.1	Yes
150	Jul 24	15:37	52.5463	130.6692	127	21	5.9	387	80.1	Yes
151	Jul 24	17:10	52.4572	130.7215	128	21	5.9	383	59.3	Yes
152	Jul 24	19:52	52.4048	130.5170	154	19	5.8	413	79.9	Yes
153	Jul 25	06:51	52.6467	131.3192	120	19	5.7	370	191.3	Yes
154	Jul 25	08:30	52.5898	131.1412	131	20	5.4	387	221.8	Yes
155	Jul 25	09:44	52.5565	131.0825	139	21	6.0	403	181.3	Yes
156	Jul 25	11:06	52.5595	131.0788	135	20	5.7	399	215.3	Yes
157	Jul 25	12:58	52.4028	130.8947	123	21	5.6	370	125.8	Yes
158	Jul 25	14:25	52.2908	130.7990	172	21	5.9	499	148.2	Yes
159	Jul 25	15:31	52.2395	130.6312	183	8	5.6	507	30.6	No
160	Jul 25	17:09	52.2053	130.8010	196	21	5.9	551	241.0	Yes
161	Jul 25	18:00	52.1838	130.8257	208	21	5.4	568	216.9	Yes
162	Jul 25	19:28	52.1150	130.8852	218	21	5.9	588	494.4	Yes
163	Jul 25	20:55	52.1688	130.6787	162	1				No
164	Jul 26	06:44	52.0695	130.3233	399	22	5.3	963	166.5	Yes
165	Jul 26	08:38	52.1398	130.4328	360	22	5.3	917	150.9	Yes
166	Jul 26	10:07	52.0837	130.4610	360	22	6.1	916	175.8	Yes
167	Jul 26	11:58	52.0632	130.5563	289	19	5.6	823	117.0	Yes
168	Jul 26	13:02	52.0447	130.5530	318	22	5.7	865	147.7	Yes
169	Jul 26	14:27	52.0665	130.6543	263	21	5.6	644	105.4	Yes
170	Jul 26	15:26	52.0963	130.6662	238	21	5.7	639	262.9	Yes
171	Jul 26	16:46	52.1030	130.6737	236	21	5.6	627	167.2	Yes
172	Jul 26	18:18	52.0242	130.7678	262	20	5.5	644	253.6	Yes
173	Jul 26	20:03	51.9737	130.5638	364	23	4.8	914	321.9	Yes
174	Jul 26	21:09	51.9393	130.5980	296	19	5.8	780	205.1	Yes
175	Jul 27	07:10	51.9243	130.7212	274	21	6.4	738	253.2	Yes
176	Jul 27	08:54	51.8997	130.6762	346	21	5.7	876	498.2	Yes
177	Jul 27	10:09	51.8457	130.6432	304	20	5.4	782	1066.0	Yes
178	Jul 27	11:49	51.8167	130.5517	276	21	6.4	687	1814.4	Yes
179	Jul 27	13:20	51.8148	130.5122	304	14	4.9	728	2268.0	No
180	Jul 27	14:25	51.8188	130.5103	293	20	5.9	715	1100.0	Yes
181	Jul 27	16:12	51.8022	130.3985	294	19	6.3	734	455.5	Yes
182	Jul 27	17:49	51.7548	130.3688	276	21	5.3	732	419.3	Yes
183	Jul 27	19:43	51.8868	130.3662	227	19	5.6	553	1206.4	Yes
184	Jul 27	21:18	51.9793	130.4078	421	21	6.1	960	155.6	Yes
185	Jul 28	06:30	52.1548	130.0830	188	19	6.2	507	644.0	Yes
186	Jul 28	08:22	51.9982	130.1373	155	21	5.8	441	131.2	Yes
187	Jul 31	06:25	51.2308	129.0182	203	20	6.0	549	784.6	Yes
188	Jul 31	07:32	51.2195	129.0508	208	21	5.4	557	220.2	Yes
189	Jul 31	08:42	51.1913	128.9858	137	19	5.9	419	163.2	Yes
190	Jul 31	10:36	51.0158	128.9563	68	21	5.7	272	125.0	Yes

Tow	Date	Time	Latitude	Longitude	Depth (m)	Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable?
191	Jul 31	12:15	51.0220	129.0868	119	21	6.8	369	126.6	Yes
192	Jul 31	14:43	51.0698	129.2997	186	3	5.7	494	162.0	No
193	Jul 31	15:25	51.0765	129.2960	184	6			258.1	No
194	Jul 31	16:41	51.1767	129.3183	287	21	5.4	780	498.5	Yes
195	Jul 31	17:55	51.1688	129.4195	287	20	6.0	731	159.2	Yes
196	Jul 31	19:48	51.2593	129.5377	271	22	6.2	715	222.5	Yes
197	Jul 31	20:33	51.2403	129.5923	261	6				No
198	Aug 02	06:25	51.0793	127.9028	156	20	6.4	454	591.3	Yes
199	Aug 02	08:25	51.0973	128.1862	155	20	5.6	475	558.9	Yes
200	Aug 02	10:30	50.9953	128.4160	88	19	5.1	273	119.7	Yes
201	Aug 02	11:54	50.9755	128.4520	87	20	4.8	274	29.9	Yes
202	Aug 02	13:07	50.9088	128.5242	69	21	5.6	275	193.5	Yes
203	Aug 02	15:01	51.1027	128.5007	144	20	5.5	440	467.1	Yes
204	Aug 02	15:52	51.1223	128.5610	139	20	5.8	439	255.5	Yes
205	Aug 02	17:16	51.1915	128.5270	194	21	5.5	548	1840.9	Yes
206	Aug 02	18:33	51.1385	128.4175	186	21	6.0	549	671.9	Yes
207	Aug 03	06:51	51.8138	130.0360	187	19	5.7	497	271.2	Yes
208	Aug 03	08:17	51.8375	130.1107	189	6	5.7	503	47.1	No
209	Aug 03	09:20	51.8387	130.1035	187	8	5.9	474	280.9	No
210	Aug 03	12:54	51.7378	130.0770	219	19	6.0	515	955.9	Yes
211	Aug 03	14:18	51.7268	130.2338	232	6	5.7	571	224.1	No
212	Aug 03	16:05	51.6742	130.2483	268	23	5.6	777	4000.0	Yes
213	Aug 03	18:54	51.6663	130.0848	345	22	5.6	915	588.6	Yes
214	Aug 03	19:58	51.6423	130.0342	351	20	5.3	870	352.3	Yes
215	Aug 03	21:10	51.6890	129.9735	355	22	5.4	871	229.7	Yes
216	Aug 04	06:35	51.7447	129.8885	340	21	6.2	871	113.9	Yes
217	Aug 04	07:40	51.7267	129.9170	349	20	6.1	876	451.8	Yes
218	Aug 04	08:52	51.7202	129.9708	342	21	5.2	872	246.5	Yes
219	Aug 04	10:30	51.6397	129.9103	312	21	5.1	777	149.1	Yes
220	Aug 04	11:28	51.6387	129.9128	316	21	6.2	827	200.5	Yes
221	Aug 04	15:50	51.4622	129.9175	237	16	5.5	593	349.3	Yes
222	Aug 04	18:37	51.3347	130.0332	283	19	5.3	732	683.4	Yes
223	Aug 04	20:05	51.2575	129.9587	284	18	6.2	733	1290.3	Yes
224	Aug 05	06:20	51.4973	129.6755	153	20	5.5	424	216.4	Yes
225	Aug 05	07:19	51.4923	129.6463	150	17	5.5	423	132.4	Yes
226	Aug 05	12:26	51.3373	129.6868	202	19	5.6	550	1055.9	Yes
227	Aug 05	15:37	51.1322	129.7570		22	5.7	1007	988.7	Yes
228	Aug 05	17:37	51.1373	129.6707	291	21	5.5	735	2785.7	Yes
229	Aug 05	19:40	51.0670	129.4953	337	20	5.3	824	994.5	Yes
230	Aug 05	21:10	51.0155	129.4687	232	19	5.9	585	823.0	Yes
231	Aug 06	06:29	50.9578	129.3570	175	21	5.6	502	487.4	Yes
232	Aug 06	07:39	51.0318	129.4097	214	19	5.8	553	634.5	Yes
233	Aug 06	09:37	50.9582	129.2753	151	17	6.0	419	191.6	Yes
234	Aug 06	14:19	51.1197	128.7573	151	22	6.0	419	78.1	Yes
235	Aug 06	15:11	51.1435	128.7955	93	20	5.8	311	131.7	Yes
236	Aug 06	17:20	51.2453	129.1375	245	22	5.4	657	534.3	Yes
237	Aug 06	18:29	51.2102	129.2475	283	21	5.8	734	676.6	Yes
238	Aug 06	19:29	51.1645	129.3048	280	19	6.0	732	1139.1	Yes

Tow	Date	Time	Latitude	Longitude	Depth (m)	Duration (min)	Speed (km/h)	Warp (m)	Catch (kg)	Usable?
239	Aug 06	20:55	51.1570	129.4205	286	21	6.1	733	693.0	Yes
240	Aug 07	06:25	51.2782	129.0497	238	20	5.6	642	1172.8	Yes
241	Aug 07	07:50	51.2857	129.1923	237	22	6.0	688	620.3	Yes
242	Aug 07	09:26	51.3793	129.3638	137	21	5.8	432	137.3	Yes
243	Aug 07	11:01	51.3622	129.1875	200	19	5.4	551	955.3	Yes
244	Aug 07	12:01	51.3643	129.1000	226	22	5.5	643	524.1	Yes
245	Aug 07	13:13	51.4187	129.0422	170	21	5.6	504	434.7	Yes
246	Aug 07	15:06	51.4748	129.0738	52	21	5.5	230	170.9	Yes
247	Aug 07	17:53	51.5093	128.5877	164	20	5.6	506	1437.8	Yes
248	Aug 07	19:34	51.3890	128.5378	184	21	5.7	551	252.9	Yes
249	Aug 07	21:14	51.2473	128.6020	192	21	5.2	552	1053.2	Yes
250	Aug 08	06:20	51.2118	128.5052	199	19	5.6	549	69.7	Yes
251	Aug 08	07:30	51.2078	128.6338	199	21	5.6	549	199.0	Yes
252	Aug 08	09:16	51.0478	128.5287	188	18	5.6	505	130.8	Yes
253	Aug 08	10:42	50.9762	128.4693	96	21	5.5	320	187.1	Yes

APPENDIX B: CATCH BY TOW

Species	1	2	3	4	5	6	7	8	9	10
Arrowtooth flounder	12.74	35.00	113.50		356.40	169.30	38.80	40.70	80.30	37.10
Big skate				56.50						
Bigmouth sculpin										
Blackbelly eelpout						3.70		2.60	0.30	4.20
Blackfin sculpin										
Bocaccio										
Brown rockfish										
Canary rockfish	34.20	2.20								
Chub mackerel										
Curlfin sole	0.70									
Darkblotched rockfish					0.50					
Dover sole	2.70	21.80	69.30		27.30	159.70	37.80	21.40	18.60	11.20
English sole	18.30	3.50		96.80	1.60		10.70	3.10	36.00	0.90
Eulachon								0.20		
Flathead sole		8.60	37.60		4.40	99.60	15.10	20.10	31.20	16.90
Greenstriped rockfish		7.30	0.80					0.40		1.70
Lingcod	1.40									4.60
Longnose skate					13.70	4.10	4.70		4.50	
Pacific cod	7.80	4.70							72.00	0.30
Pacific hake										
Pacific halibut				8.70						
Pacific ocean perch		0.30			2719.90	66.30	0.40	88.80	5.60	
Pacific sanddab	30.10			99.28						
Petrale sole	3.30	1.20				1.20				
Pygmy rockfish										
Quillback rockfish	25.70									
Redbanded rockfish					2.20	7.40		1.40		
Redstripe rockfish	102.90	1.70	1.00		1.10					
Rex sole	4.40	127.40	74.10	0.30	20.10	17.10	19.90	14.40	4.50	8.30
Rosethorn rockfish										
Rougheye rockfish										
Roughtail skate										
Sablefish		27.00	8.10		6.70	3.30				
Sandpaper skate						6.80				
Sharpchin rockfish										0.20
Shortraker rockfish										
Shortspine thornyhead						1.80				
Silvergray rockfish					5.10				15.70	6.10
Slender sole		11.00	6.60			3.40	2.30	5.30	1.30	2.60
Southern rock sole	4.80			88.90						
Spiny dogfish	13.20					10.20	8.00	5.10	13.40	5.40
Splitnose rockfish										
Spotted ratfish	19.50	10.70	5.30	0.40	1.50	3.20	2.50	2.80	7.80	6.50
Threadfin sculpin		0.80								
Walleye pollock										
Widow rockfish	67.50									
Wolf eel										
Yelloweye rockfish										
Yellowmouth rockfish					14.70					
Yellowtail rockfish	148.00		1.50							
Other	12.56	0.80	5.92	1.06		0.50			0.20	15.00
Total	509.80	264.00	323.72	351.94	3175.20	557.60	140.20	206.30	291.40	121.00

Species	11	12	13	14	15	16	17	18	19	20
Arrowtooth flounder	613.40	57.60	51.70	7.20	5.20	23.60	17.10	29.80	7.10	44.40
Big skate										
Bigmouth sculpin										
Blackbelly eelpout							0.10	0.20		
Blackfin sculpin										
Bocaccio										
Brown rockfish										
Canary rockfish										
Chub mackerel										
Curlfin sole										
Darkblotched rockfish						0.30				
Dover sole	2.90	1.20	4.60	0.50		2.10		0.80		
English sole	0.20								1.70	
Eulachon				3.00	8.80	0.60				
Flathead sole	23.80	6.50	1.80		0.30	3.40	7.50	9.30		0.40
Greenstriped rockfish										6.90
Lingcod									4.90	
Longnose skate	2.60	13.10	8.20			9.50	4.50	3.80		
Pacific cod					0.30					9.40
Pacific hake			2.70							
Pacific halibut					4.80				3.80	
Pacific ocean perch		0.30	3.40	0.20	0.06	0.40			0.10	2.80
Pacific sanddab										
Petrale sole									13.40	4.60
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish			22.50	9.90						5.40
Redstripe rockfish										
Rex sole	2.80	0.80				0.30	2.40	2.00	0.90	7.90
Rosethorn rockfish			1.50							
Rougheye rockfish		2.30	3.00			1.20				
Roughtail skate										
Sablefish	4.30	4.60	11.30				5.30			2.10
Sandpaper skate				0.60						
Sharpchin rockfish			1.40	0.20						
Shortraker rockfish										
Shortspine thornyhead			1.00							
Silvergray rockfish	12.70	9.40						5.30	3.70	6.10
Slender sole						0.10	0.20			0.20
Southern rock sole								0.40	0.90	
Spiny dogfish	3.60	2.40	1.90	0.60		10.50	13.90	12.70	3.20	8.60
Splitnose rockfish										
Spotted ratfish	6.20	0.70	5.80	9.50	3.50	1.70	4.50	0.90	1.10	2.20
Threadfin sculpin										
Walleye pollock										3.20
Widow rockfish										
Wolf eel										
Yelloweye rockfish									21.90	6.20
Yellowmouth rockfish										
Yellowtail rockfish	3.00	5.50								
Other	1.10	1.20	329.18	5.10	4.50	4.20	0.70	0.60	0.60	3.72
Total	676.60	105.60	449.98	36.80	27.46	57.90	56.20	65.80	63.30	114.12

Species	21	22	23	24	25	26	27	28	29	30
Arrowtooth flounder	115.50	45.90	44.30	2.80	34.00	18.30	57.30	19.50	26.10	3.40
Big skate										
Bigmouth sculpin		4.80								3.10
Blackbelly eelpout								0.10		
Blackfin sculpin										
Bocaccio										
Brown rockfish										
Canary rockfish										
Chub mackerel										
Curlfin sole										
Darkblotched rockfish										
Dover sole		0.40	1.10	0.30			1.40			
English sole										2.00
Eulachon					0.60					
Flathead sole				0.20					1.90	
Greenstriped rockfish	0.30	1.70		0.80						
Lingcod			11.10							
Longnose skate	1.20	1.70	3.10	7.60		0.80		2.30	9.00	7.80
Pacific cod	1.38	1.70	26.00						0.40	15.70
Pacific hake										
Pacific halibut			9.70							4.10
Pacific ocean perch	1.00	92.00	4.60	1.70			14.60	0.20	0.10	0.60
Pacific sanddab										
Petrale sole			0.90						2.20	2.10
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish	2.30	8.60	13.40	2.00	2.20		186.40	6.70	4.40	
Redstripe rockfish		0.10								
Rex sole	2.90	8.10	3.00						7.00	20.50
Rosethorn rockfish					0.50					
Rougheye rockfish				0.80						
Roughtail skate										
Sablefish	3.80	4.40							1.20	
Sandpaper skate							0.70			
Sharpchin rockfish		0.20	1.10							
Shortraker rockfish										
Shortspine thornyhead				0.90	0.40					
Silvergray rockfish		1.90		3.70			1.80		66.90	19.80
Slender sole	0.40					0.10		0.10		0.20
Southern rock sole										
Spiny dogfish	12.10	14.20	9.60	1.20	1.20		8.70	2.70	7.80	
Splitnose rockfish										
Spotted ratfish	6.80	0.20	3.40		0.30			0.90	0.60	1.50
Threadfin sculpin										
Walleye pollock	0.30	0.80	0.80							0.40
Widow rockfish				2.10						
Wolf eel										
Yelloweye rockfish			2.10							
Yellowmouth rockfish				2.20						
Yellowtail rockfish				3.80	38.20	13.30			511.40	3.20
Other	10.75	2.40	11.80	12.00	4.70	0.52	5.30	0.30		0.60
Total	158.73	189.10	146.00	42.10	82.10	33.02	276.20	32.80	639.00	85.00

Species	31	32	33	34	35	36	37	38	39	40
Arrowtooth flounder	4.70	7.10	16.90	5.90	11.10	11.10	7.20	16.00	15.70	7.50
Big skate										
Bigmouth sculpin										
Blackbelly eelpout										
Blackfin sculpin										0.40
Bocaccio										
Brown rockfish										
Canary rockfish										
Chub mackerel										
Curlfin sole										
Darkblotched rockfish					0.30					
Dover sole		0.90	0.70		0.60	6.10	15.40	32.00	6.40	5.30
English sole										
Eulachon										
Flathead sole	0.50	0.80	0.40							
Greenstriped rockfish										
Lingcod										
Longnose skate		11.00					3.00			
Pacific cod	5.36	1.70		1.60						1.90
Pacific hake							11.30			
Pacific halibut										
Pacific ocean perch	0.50	99.70	7.50	0.40	46.10	3.60	18.40	10.60	12.00	128.20
Pacific sanddab										
Petrale sole										
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish	3.70	12.70	7.40		5.10	4.10			7.00	1.70
Redstripe rockfish					0.50					
Rex sole	13.00	4.80	13.30	0.84	6.60	2.10	18.00	20.30	2.50	10.90
Rosethorn rockfish		0.50								4.10
Rougheye rockfish		3.00				1.00	58.70	20.60		
Roughtail skate										
Sablefish		5.70	3.00		3.20	2.20	65.30	38.70	6.70	2.20
Sandpaper skate							3.10			
Sharpchin rockfish		30.90								19.00
Shortraker rockfish										
Shortspine thornyhead		2.10			0.50	4.80	7.60	16.90	5.50	27.70
Silvergray rockfish	35.50	20.80	86.10	30.60	14.90	2.30			2.30	4.60
Slender sole					0.40	0.40			0.50	
Southern rock sole										
Spiny dogfish			2.00						10.50	
Splitnose rockfish					132.80	4.20	1.10		4.60	0.80
Spotted ratfish	0.90	0.50	3.30	0.50						
Threadfin sculpin										
Walleye pollock	1.60		0.60	0.60	3.40					0.60
Widow rockfish						1.90				4.30
Wolf eel										
Yelloweye rockfish										
Yellowmouth rockfish		1.80								10.80
Yellowtail rockfish				2.70						
Other	18.14	3.86	0.30		0.70	0.80	27.00	8.70	1.70	
Total	83.90	207.86	141.50	43.14	226.20	44.60	236.10	163.80	75.40	230.00

Species	41	42	43	44	45	46	47	48	49	50
Arrowtooth flounder	26.80	336.30	6.40	9.20	35.50	31.10	13.20	45.20	6.90	92.20
Big skate										
Bigmouth sculpin								2.40		
Blackbelly eelpout										
Blackfin sculpin		2.10								
Bocaccio										
Brown rockfish										
Canary rockfish									1.80	
Chub mackerel										
Curlfin sole										
Darkblotched rockfish										
Dover sole	27.80	31.10	4.60	7.20	6.70	13.70	26.80	17.30		22.80
English sole			16.60						2.00	0.40
Eulachon				0.10						
Flathead sole							1.80	3.20	0.80	18.20
Greenstriped rockfish								4.50		
Lingcod		5.60	13.60							
Longnose skate			19.40							6.50
Pacific cod								13.20		
Pacific hake	2.00			8.90	19.00	7.10				
Pacific halibut			10.30			2.60				9.50
Pacific ocean perch	27.10	572.10		106.00	557.60	491.00	399.00	674.80	44.70	10.70
Pacific sanddab										
Petrale sole			9.60							1.40
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish		15.60		1.10	40.30	5.10	3.90	25.30	1.50	
Redstripe rockfish										4.90
Rex sole	26.80	1.90	4.30	0.70	53.90	32.30	11.00	21.30	45.70	25.10
Rosethorn rockfish	0.38							0.40		
Rougheye rockfish	1.90	14.90		12.20	9.90	1.50	34.20			
Roughtail skate										
Sablefish	12.90	10.60		3.70	8.70	2.50	142.60	3.00	2.30	
Sandpaper skate		3.70								
Sharpchin rockfish	0.24							20.80		
Shortraker rockfish										
Shortspine thornyhead	15.10	25.80		18.20	15.00	13.10	7.60	8.00		
Silvergray rockfish			19.70	2.00				7.00	1.80	46.20
Slender sole				0.20	0.50	0.70	0.70	0.90		0.60
Southern rock sole			1.90							
Spiny dogfish				9.70					2.70	
Splitnose rockfish	1.00					0.20				
Spotted ratfish			1.90	0.20	1.20				1.40	8.90
Threadfin sculpin									0.30	
Walleye pollock	2.60									
Widow rockfish					0.40					
Wolf eel										
Yelloweye rockfish			4.10							
Yellowmouth rockfish		1.80				1.40				
Yellowtail rockfish										1.40
Other	2.80	0.90		0.90	7.61	0.80	1.40	0.50		13.90
Total	147.42	1022.40	112.40	180.30	756.31	603.10	642.20	847.80	111.90	262.70

Species	51	52	53	54	55	56	57	58	59	60
Arrowtooth flounder	99.20	87.40				87.70		69.20	9.00	
Big skate				3.60			2.00		3.10	22.50
Bigmouth sculpin										
Blackbelly eelpout						1.00				
Blackfin sculpin										
Bocaccio										
Brown rockfish										
Canary rockfish						2.10			95.70	
Chub mackerel										
Curlfin sole			0.80		1.50		0.70			
Darkblotched rockfish										
Dover sole	4.50	1.50				29.40		11.40		
English sole	6.20	46.50	3.20	3.90	2.80	0.50		17.60		
Eulachon						0.30				
Flathead sole	5.90					8.30		1.30		
Greenstriped rockfish									0.30	
Lingcod		8.00				5.20	4.60	24.40	9.00	5.80
Longnose skate						2.40		7.10		
Pacific cod					0.20			8.10	2.90	
Pacific hake	1.80									
Pacific halibut	4.50		13.40						7.00	103.40
Pacific ocean perch	4.00					269.90			0.20	
Pacific sanddab			126.30	49.10	180.00		1.90			
Petrale sole	1.40	1.00		0.50			1.00		1.20	
Pygmy rockfish										
Quillback rockfish									0.80	
Redbanded rockfish										
Redstripe rockfish										
Rex sole	149.60	9.00	0.24		5.60	71.00	0.20	27.10		
Rosethorn rockfish										
Rougheye rockfish						0.80				
Roughtail skate										
Sablefish	1.40	0.70				1.10				
Sandpaper skate										
Sharpchin rockfish									0.10	
Shortraker rockfish										
Shortspine thornyhead										
Silvergray rockfish	1.60									
Slender sole	0.50	0.30				0.40		2.30		
Southern rock sole			3.40	2.30	41.30		64.80			9.90
Spiny dogfish									13.80	8.10
Splitnose rockfish										
Spotted ratfish	1.90	2.90	1.40			1.90	9.20	7.20	24.70	
Threadfin sculpin									0.40	1.20
Walleye pollock						1.90			0.10	
Widow rockfish										
Wolf eel				3.10						
Yelloweye rockfish										
Yellowmouth rockfish										
Yellowtail rockfish										
Other			2.10	0.30	1.10	2.20		1.40	1.90	2.00
Total	282.50	157.30	150.84	62.80	232.50	486.10	84.40	177.10	170.20	152.90

Species	61	62	63	64	65	66	67	68	69	70
Arrowtooth flounder						3.60	15.50	5.50	64.40	37.00
Big skate	227.50	14.70	15.10							
Bigmouth sculpin										
Blackbelly eelpout										0.50
Blackfin sculpin										
Bocaccio										
Brown rockfish										
Canary rockfish							4.90	4.70		
Chub mackerel										
Curlfin sole							0.60			
Darkblotched rockfish										
Dover sole								2.70	2.00	1.30
English sole								0.60		0.50
Eulachon									0.20	
Flathead sole							1.70		2.80	44.40
Greenstriped rockfish								6.40		
Lingcod				17.20		11.30	7.90			3.00
Longnose skate		4.00				3.50			3.20	
Pacific cod							6.20	1.10	6.20	
Pacific hake										
Pacific halibut		44.70	18.00			55.90	4.20			
Pacific ocean perch								24.50	4.40	1.20
Pacific sanddab	1.70				3.00	0.10				
Petrale sole					2.40		0.70		5.00	
Pygmy rockfish				11.80						0.30
Quillback rockfish				1.30		30.90	1.50			
Redbanded rockfish								116.10	2.50	
Redstripe rockfish				50.90		11.20	0.10			
Rex sole								9.00	13.30	0.40
Rosethorn rockfish								4.20	0.40	
Rougheye rockfish										
Roughtail skate										
Sablefish								1.20	1.10	
Sandpaper skate										
Sharpchin rockfish								8.10		
Shortraker rockfish										
Shortspine thornyhead										
Silvergray rockfish				3.00				23.40		
Slender sole								1.10	0.40	1.30
Southern rock sole	16.30	41.60	8.30		2.40	18.10				
Spiny dogfish	523.70	438.30	62.10		3.70	33.30	10.50	3.30	20.80	1.50
Splitnose rockfish										
Spotted ratfish				7.00		2.80	19.80	2.50	4.90	6.60
Threadfin sculpin		0.20								
Walleye pollock								0.10	0.30	
Widow rockfish										
Wolf eel										
Yelloweye rockfish				6.10						
Yellowmouth rockfish										
Yellowtail rockfish										
Other	1.50	1.40	0.60	4.50		3.30		2.60	9.00	7.20
Total	770.70	544.90	104.10	101.80	11.50	174.00	73.60	217.10	140.90	105.20

Species	71	72	73	74	75	76	77	78	79	80
Arrowtooth flounder	27.90	58.90	19.60	31.40	98.80	20.70	43.60	0.80	49.10	2.30
Big skate										
Bigmouth sculpin										
Blackbelly eelpout	0.20							0.20		
Blackfin sculpin			0.20		0.40	0.40				
Bocaccio										94.50
Brown rockfish										
Canary rockfish				127.00	13.60					414.10
Chub mackerel										
Curlfin sole			0.30							
Darkblotched rockfish										
Dover sole	0.50				0.20	3.90			1.80	
English sole	0.30							0.30		
Eulachon	0.90	0.20				0.20				
Flathead sole	13.00	6.80								
Greenstriped rockfish	0.90	1.00	2.80	0.50	1.50		0.60			
Lingcod	18.50				6.50		2.50	2.20		12.00
Longnose skate	28.20				12.40				11.20	15.80
Pacific cod	9.30	5.80	5.50	4.70	7.30		84.70	0.50	16.10	6.90
Pacific hake	0.40									
Pacific halibut			12.80		34.20					
Pacific ocean perch	0.30	3.30	1.20	1.00	21.30	1.20	3.90		0.90	
Pacific sanddab								1.50		
Petrale sole	9.40			1.20			1.70		1.50	0.50
Pygmy rockfish										2.60
Quillback rockfish								0.50		
Redbanded rockfish		10.80			1.00	3.30	6.80			
Redstripe rockfish		1.00	0.30				0.20			60.50
Rex sole	14.60	3.50	3.40	4.20	4.20		0.60	2.50	6.50	1.20
Rosethorn rockfish										
Rougheye rockfish						1.10				
Roughtail skate										
Sablefish	0.60		1.30		2.10					
Sandpaper skate									0.80	
Sharpchin rockfish		0.50	0.50	0.10	1.00		0.30	0.10	0.10	8.40
Shortraker rockfish										
Shortspine thornyhead										
Silvergray rockfish		21.90	6.20	1.90	1.90	3.60	17.30	1.50	41.40	164.90
Slender sole	6.30					0.60				
Southern rock sole										
Spiny dogfish	3.80	31.80	31.30	40.50	43.10	16.90	50.80		98.10	52.00
Splitnose rockfish										
Spotted ratfish	5.90	3.90	5.40	1.20	0.60		1.60	3.30	2.70	5.90
Threadfin sculpin	0.50			0.20				0.50	0.50	0.10
Walleye pollock	11.30	3.00		1.50	5.80			0.70	7.50	
Widow rockfish										
Wolf eel										
Yelloweye rockfish			5.80		1.80		11.00			96.80
Yellowmouth rockfish										
Yellowtail rockfish					4.30					0.80
Other	8.80	0.30		0.40	6.30	5.80	1.00	8.30	1.20	10.10
Total	161.60	152.70	96.60	215.80	268.30	57.70	226.60	22.90	239.40	949.40

Species	81	82	83	84	85	86	87	88	89	90
Arrowtooth flounder	24.00	19.60	17.60	10.30	12.80	3.50	2.50	14.10	15.50	4.80
Big skate										
Bigmouth sculpin										
Blackbelly eelpout							0.20			
Blackfin sculpin										
Bocaccio				3.80						
Brown rockfish										
Canary rockfish										
Chub mackerel										
Curlfin sole										
Darkblotched rockfish										
Dover sole	2.60	12.40	3.00	1.60	2.60	0.50		0.60	0.40	5.80
English sole										
Eulachon			4.10		1.20	0.40	0.80		2.50	0.20
Flathead sole		0.30			0.90	2.00	0.50	0.90	1.70	
Greenstriped rockfish	4.30									
Lingcod				1.10						
Longnose skate		0.20			3.70		12.20			
Pacific cod	14.80			2.40				5.80		
Pacific hake			10.30							
Pacific halibut										
Pacific ocean perch	10.20	3.20	1.40	27.10	2.50	2.00		19.90	3.80	16.20
Pacific sanddab										
Petrale sole	0.40									
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish		1.80	2.30	37.10	5.10	8.00	4.70	1.50	0.50	
Redstripe rockfish	74.80									
Rex sole	10.20	3.00	2.80	8.70	4.30	0.90	2.30	2.10	2.40	5.50
Rosethorn rockfish										
Rougheye rockfish			5.80	0.10		6.70				
Roughtail skate										
Sablefish	1.30		7.00		1.10	1.10		3.10		2.00
Sandpaper skate			2.00		1.00	1.10				
Sharpchin rockfish	2.00			39.10						
Shortraker rockfish										
Shortspine thornyhead		3.30		10.50	2.50	1.90	2.80	0.20	9.00	4.20
Silvergray rockfish	2.40		2.40	2.20		5.90	2.60	4.20		
Slender sole		0.40	0.20		0.30	0.20	0.70	1.50	0.40	0.20
Southern rock sole										
Spiny dogfish	28.30	5.30	4.70			5.60	2.30	1.20	2.10	
Splitnose rockfish										
Spotted ratfish	9.90		1.60							
Threadfin sculpin										
Walleye pollock	0.80			25.70				14.90		
Widow rockfish										
Wolf eel										
Yelloweye rockfish	6.90									
Yellowmouth rockfish										
Yellowtail rockfish										
Other	0.60	1.70	0.80	23.80	4.70	2.30	0.90	1.70	4.90	8.40
Total	193.50	51.20	66.00	193.50	42.70	42.10	32.50	71.70	43.20	47.30

Species	91	92	93	94	95	96	97	98	99	100
Arrowtooth flounder	32.90	18.10	2.20	4.10				10.00	38.40	32.20
Big skate										
Bigmouth sculpin										
Blackbelly eelpout			0.30	0.20						
Blackfin sculpin					0.60	0.50	0.50	0.90		
Bocaccio										
Brown rockfish										
Canary rockfish										
Chub mackerel										
Curlfin sole										
Darkblotched rockfish										
Dover sole	2.00	17.00	6.30	5.10	0.80	1.20			13.90	11.20
English sole									36.50	
Eulachon		0.30	0.90							
Flathead sole	0.10								1.90	4.40
Greenstriped rockfish										
Lingcod								4.90	2.00	
Longnose skate	12.30	2.20		8.30					14.50	
Pacific cod				2.10						
Pacific hake		5.50	3.00		8.90	0.90	7.20		1.30	
Pacific halibut										7.20
Pacific ocean perch	13.70	74.00	21.90	11.50	86.70	97.80	108.50	415.00	3.90	1.90
Pacific sanddab										
Petrale sole									1.00	
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish	3.40			1.50	0.20	1.60	0.80	65.40	3.80	49.20
Redstripe rockfish						13.60	2.30			
Rex sole	4.00			6.70	3.20	0.40			4.00	3.20
Rosethorn rockfish					1.60	5.20	1.80	15.30		
Rougheye rockfish		7.00	1.00		11.10	11.20	4.30	6.10		
Roughtail skate		8.90								
Sablefish	0.80	42.10	65.90	0.90					1.40	4.10
Sandpaper skate		1.20								
Sharpchin rockfish								547.40		
Shortraker rockfish			1.80		30.10		15.80			
Shortspine thornyhead	0.80	20.40	18.70	0.20	29.00	10.90	10.00	50.90		
Silvergray rockfish	4.10			4.80			1.76	20.50	10.30	2.10
Slender sole	1.70	0.10		0.10					0.20	
Southern rock sole										
Spiny dogfish	4.80	4.10							3.00	1.20
Splitnose rockfish				4.00				4.90		
Spotted ratfish		0.90						1.50	0.60	1.20
Threadfin sculpin										
Walleye pollock	0.60			9.30				1.30		
Widow rockfish										
Wolf eel										
Yelloweye rockfish					10.20					
Yellowmouth rockfish						41.40	8.50	1.20		
Yellowtail rockfish										
Other	0.40	8.20	11.10	3.30	2.20	3.90	0.68	0.60	0.80	1.00
Total	81.60	210.00	133.10	62.10	184.60	188.60	162.14	1145.90	137.50	118.90

Species	101	102	103	104	105	106	107	108	109	110
Arrowtooth flounder	21.10	20.20	15.40	19.50	11.30	8.40	4.50	6.50	7.70	38.30
Big skate									9.40	
Bigmouth sculpin										
Blackbelly eelpout										
Blackfin sculpin										
Bocaccio								10.30		
Brown rockfish										
Canary rockfish							1.90	13.90		
Chub mackerel										
Curlfin sole										
Darkblotched rockfish										
Dover sole	5.30	5.30	3.40	4.50	12.10	20.00	0.90		0.10	59.70
English sole									22.10	0.20
Eulachon										
Flathead sole									5.40	2.80
Greenstriped rockfish										
Lingcod						1.90			135.50	
Longnose skate			2.60							
Pacific cod									10.60	
Pacific hake	11.50	7.00	4.80	10.20	14.40	2.70	1.90			2.20
Pacific halibut									15.70	6.20
Pacific ocean perch	377.60	302.80	233.40	420.60	401.10	133.10	143.90	1.00		438.40
Pacific sanddab										
Petrale sole									0.90	
Pygmy rockfish								0.30		
Quillback rockfish										
Redbanded rockfish	28.10	18.90	8.10	13.20	20.70	2.90		12.20		20.60
Redstripe rockfish			0.60					1931.50		
Rex sole	0.40	1.50	0.20		0.20	0.50	0.30	0.40	1.10	1.50
Rosethorn rockfish								1.30		
Rougheye rockfish	8.80	16.70	14.60	12.90	25.20	17.40				
Roughtail skate										
Sablefish		1.10	7.20	5.00	9.20	6.50	2.80			
Sandpaper skate					1.20					
Sharpchin rockfish								23.10		
Shortraker rockfish										
Shortspine thornyhead		0.70	0.80	1.50	3.90	6.20				3.90
Silvergray rockfish	1.70			2.50				26.90		
Slender sole			0.20				0.20			0.10
Southern rock sole									16.00	
Spiny dogfish							7.80		2.10	
Splitnose rockfish										
Spotted ratfish	0.40				0.30		1.20		1.80	1.50
Threadfin sculpin										
Walleye pollock								0.40	0.20	
Widow rockfish										
Wolf eel										
Yelloweye rockfish								4.40		
Yellowmouth rockfish	1.70		39.40	7.60			7.30	1.30		
Yellowtail rockfish			1.50							
Other	1.70	0.60	0.60	1.30	0.30	0.80	0.30	7.70	1.70	0.60
Total	458.30	374.80	332.80	498.80	499.90	200.40	173.00	2041.20	230.30	576.00

Species	111	112	113	114	115	116	117	118	119	120
Arrowtooth flounder	74.90	88.50	147.80	14.00	25.10	26.70	68.10	150.80	99.20	30.30
Big skate										
Bigmouth sculpin										
Blackbelly eelpout	0.40	0.60	4.00	0.50	0.10	0.20	0.80	5.70		1.40
Blackfin sculpin			0.10							
Bocaccio										4.90
Brown rockfish										
Canary rockfish					2.50					
Chub mackerel										
Curlfin sole										
Darkblotched rockfish										
Dover sole	22.60	23.20	11.40	2.10	13.00	7.00	5.30	50.00	66.60	20.70
English sole	0.30	0.40		27.20	0.20	2.30	0.30	1.90		1.80
Eulachon	0.80	0.20	12.40			0.10				
Flathead sole	3.00	84.60	19.90		1.30		11.70	2.00	16.30	22.80
Greenstriped rockfish			2.20		5.40	2.00			0.40	0.80
Lingcod			3.90	11.80						
Longnose skate	12.70	12.70		6.80		4.30			2.90	
Pacific cod			0.90	0.30	3.50	1.20				2.10
Pacific hake	1.10				3.80		5.30			
Pacific halibut									4.80	
Pacific ocean perch	2.40	0.10	2.00	0.40	189.60	1.10	995.40	200.40	279.20	2.60
Pacific sanddab				8.70						
Petrale sole	0.50			11.20						
Pygmy rockfish					1.20					
Quillback rockfish				2.90						
Redbanded rockfish	2.30		1.80		1.00				6.20	
Redstripe rockfish					4.10	0.40			8.20	115.40
Rex sole	1.40	8.60	6.90	6.00	9.40	10.40	33.00	108.00	49.70	38.90
Rosethorn rockfish					1.00					
Rougheye rockfish	0.30	0.20				0.10				
Roughtail skate										
Sablefish		1.00	2.00		5.40			1.80	25.90	5.90
Sandpaper skate										
Sharpchin rockfish					1.30					0.40
Shortraker rockfish										
Shortspine thornyhead										
Silvergray rockfish		2.90	2.40		25.70	1.50	14.90	3.90	15.70	
Slender sole	1.40	4.20	0.10		0.90	0.60		0.30	3.90	1.40
Southern rock sole										0.60
Spiny dogfish	3.50	4.70	8.90	9.90	16.60	10.50	2.90		1.80	1.90
Splitnose rockfish										
Spotted ratfish	0.10	1.70	0.80	8.90	1.50	3.90		0.60	2.90	1.70
Threadfin sculpin			0.20			0.10				
Walleye pollock							1.80	7.70	1.90	
Widow rockfish							2.30	1.30		
Wolf eel										
Yelloweye rockfish					4.20					
Yellowmouth rockfish					1.60		82.70			
Yellowtail rockfish		16.70			5.10		6.20	1.80	10.00	
Other	3.30	5.60	11.40	0.80	2.10	0.60	0.90	0.10	0.10	2.50
Total	131.00	255.90	239.10	111.50	325.60	73.00	1231.60	536.30	595.70	256.10

Species	121	122	123	124	125	126	127	128	129	130
Arrowtooth flounder	329.00	11.30	1.80		1.00	0.30		0.60	1.80	1.30
Big skate										
Bigmouth sculpin										
Blackbelly eelpout										
Blackfin sculpin										
Bocaccio			4.70							
Brown rockfish										
Canary rockfish			2.10	1.80	167.70	7.90	3.90			
Chub mackerel										
Curlfin sole										
Darkblotched rockfish										
Dover sole	12.80	2.80								
English sole	0.20									
Eulachon										
Flathead sole	2.80									
Greenstriped rockfish	0.60		0.60					0.50		
Lingcod				2.00		10.80	1.10	4.40		3.40
Longnose skate	5.60									6.80
Pacific cod	5.30		2.20		0.50	0.50			0.90	1.70
Pacific hake	12.50									
Pacific halibut						9.30		15.40	1.80	
Pacific ocean perch	1.10	319.80	75.40			31.50				
Pacific sanddab						1.60				
Petrale sole								0.40		7.70
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish		4.80	1.60							
Redstripe rockfish	6.20	1.30	416.90				35.00	2.30	0.10	
Rex sole	39.90		7.00		0.10					
Rosethorn rockfish			2.20							
Rougheye rockfish										
Roughtail skate										
Sablefish	21.40									
Sandpaper skate										
Sharpchin rockfish			19.80							
Shortraker rockfish										
Shortspine thornyhead		1.00								
Silvergray rockfish		6.40	14.70				4.50		5.40	
Slender sole										
Southern rock sole										
Spiny dogfish	0.90	4.60	35.60		12.60	2.80	10.30	2.40	7.40	7.50
Splitnose rockfish		2.30								
Spotted ratfish	2.20		0.10		3.80	0.50	1040.10	22.90	10.80	39.90
Threadfin sculpin										
Walleye pollock	12.80	0.80								
Widow rockfish										
Wolf eel										
Yelloweye rockfish			45.80			11.70		7.90		
Yellowmouth rockfish		125.00								
Yellowtail rockfish										
Other		8.04	51.94		2.80	3.60		1.60		0.70
Total	453.30	488.14	682.44	3.80	188.50	80.50	1094.90	58.40	28.20	69.00

Species	131	132	133	134	135	136	137	138	139	140
Arrowtooth flounder	3.30	18.20	9.20	7.60	11.70	5.90	9.20	5.50	10.30	
Big skate										
Bigmouth sculpin										
Blackbelly eelpout										
Blackfin sculpin										
Bocaccio										
Brown rockfish										
Canary rockfish										
Chub mackerel										
Curlfin sole										
Darkblotched rockfish				2.00						
Dover sole				12.60	0.40	2.60	28.20	6.80	17.70	5.70
English sole										
Eulachon				0.20				0.50		
Flathead sole										
Greenstriped rockfish										
Lingcod		2.70	2.80							
Longnose skate		5.80	10.60	3.80	9.50	21.60	2.00	22.80	7.40	
Pacific cod	1.90	0.30	4.90							
Pacific hake				3.30		1.20	1.20	1.40	3.30	3.00
Pacific halibut										
Pacific ocean perch				50.20	0.20	3.30	17.80	30.60	22.00	4.50
Pacific sanddab	1.70									
Petrale sole	1.90	14.20	11.80							
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish				4.80			1.50	1.20	2.00	
Redstripe rockfish			0.20							
Rex sole	0.40	9.30	3.40	11.40		0.50	0.80	0.40	0.30	2.80
Rosethorn rockfish										
Rougheye rockfish				6.80	4.10	10.40	5.80	2.80		
Roughtail skate									6.20	
Sablefish				52.10	55.20	77.90	49.30	29.70	21.40	3.10
Sandpaper skate					1.80	2.50				
Sharpchin rockfish							0.81			
Shortraker rockfish										
Shortspine thornyhead				12.00	19.90	18.90	18.60	23.40	20.90	8.30
Silvergray rockfish	16.90	50.80	20.80	2.20						
Slender sole										
Southern rock sole										
Spiny dogfish	5.20	6.50	9.80	11.90		2.40		2.40	1.50	
Splitnose rockfish				0.50						
Spotted ratfish	13.80	3.70	23.00	1.30			1.40			
Threadfin sculpin										
Walleye pollock		0.10	4.20						0.50	
Widow rockfish		62.20								
Wolf eel										
Yelloweye rockfish										
Yellowmouth rockfish										
Yellowtail rockfish		77.20								
Other			1.50	53.10	16.30	19.04	16.40	28.30	16.88	3.10
Total	45.10	251.00	102.20	235.80	119.10	166.24	153.01	155.80	130.38	30.50

Species	141	142	143	144	145	146	147	148	149	150
Arrowtooth flounder	13.50	1.20	8.80	1.60	4.10	19.80	133.20	104.80	4.40	0.60
Big skate										
Bigmouth sculpin										
Blackbelly eelpout										
Blackfin sculpin	1.10	1.00								
Bocaccio										
Brown rockfish										
Canary rockfish					232.40	8.20	2.20			
Chub mackerel										
Curlfin sole										
Darkblotched rockfish				1.70						
Dover sole	2.40	1.40	1.20		0.80	0.01	0.30	2.40		
English sole							6.10	19.40	0.80	10.60
Eulachon			0.20							
Flathead sole		0.30			0.30		1.40		0.10	
Greenstriped rockfish					2.80	2.00	0.60			
Lingcod							1.40		3.40	7.30
Longnose skate										
Pacific cod	6.80	3.30		2.80	7.20	2.70	5.80	0.70	3.10	1.10
Pacific hake										
Pacific halibut							3.10			1.50
Pacific ocean perch	432.80	764.00	22.60	189.40	6.30	0.40				
Pacific sanddab										2.50
Petrale sole					1.30		0.80	0.80	4.10	7.00
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish	31.40	49.70	1.20	7.80						
Redstripe rockfish										
Rex sole	6.00	0.50	1.20	1.00	6.80	9.00	30.50	43.20	19.20	4.80
Rosethorn rockfish	4.40	8.20		1.40						
Rougheye rockfish	3.20		1.80	1.00						
Roughtail skate										
Sablefish		3.20	9.20		1.00	1.50				
Sandpaper skate										
Sharpchin rockfish	83.50	136.40		9.50						
Shortraker rockfish	25.30									
Shortspine thornyhead	28.00	21.50	12.30	11.50						
Silvergray rockfish	24.60	109.80	4.20	30.60	201.80	15.60	199.20	11.30	58.90	30.20
Slender sole										0.04
Southern rock sole										
Spiny dogfish	3.00		1.80		8.90	1.70	6.70	6.70	16.30	9.30
Splitnose rockfish										
Spotted ratfish	1.90		1.20	0.30	1.70	3.40	1.90		6.10	3.60
Threadfin sculpin										
Walleye pollock	5.20	9.76	2.20	5.80		0.40	1.80	0.40		
Widow rockfish										
Wolf eel										
Yelloweye rockfish						1.50				
Yellowmouth rockfish										
Yellowtail rockfish										
Other	0.20	0.70	3.10	5.80	5.40	7.10		4.40	0.70	1.60
Total	673.30	1110.96	71.00	270.20	480.80	73.31	395.00	194.10	117.10	80.14

Species	151	152	153	154	155	156	157	158	159	160
Arrowtooth flounder	1.40	3.00	10.80	47.80	24.70	33.20	7.10	5.10	2.90	8.50
Big skate										
Bigmouth sculpin										
Blackbelly eelpout										
Blackfin sculpin										
Bocaccio				4.20	2.00	4.70				
Brown rockfish										
Canary rockfish		10.80								
Chub mackerel										
Curlfin sole						0.40				
Darkblotched rockfish										
Dover sole			2.70	1.40	1.00	0.80		3.80		1.00
English sole	2.10		67.30	21.10	40.00	15.10	2.70	0.20		
Eulachon										
Flathead sole			7.50	1.40						
Greenstriped rockfish								0.70	0.70	
Lingcod	1.50					1.80				2.60
Longnose skate	1.00	15.50							12.80	
Pacific cod	0.30	0.20	26.00	20.60	38.70	26.30	17.40	4.60	0.90	3.40
Pacific hake			2.10							
Pacific halibut	11.50					8.60	3.60	40.60		
Pacific ocean perch								0.30	1.40	40.60
Pacific sanddab			6.70				1.90			
Petrale sole	1.20	2.20	13.10	23.90	22.70	22.30	3.90	0.70		
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish										4.30
Redstripe rockfish										
Rex sole	8.10	0.90	12.40	31.90	16.40	15.00	0.80	35.90	0.50	4.70
Rosethorn rockfish										
Rougheye rockfish										
Roughtail skate										
Sablefish								2.40		8.70
Sandpaper skate										
Sharpchin rockfish										
Shortraker rockfish										
Shortspine thornyhead										
Silvergray rockfish	17.60	17.80	1.60	47.00	25.50	72.00	80.60	17.30	6.60	117.90
Slender sole				0.50	0.30					
Southern rock sole				0.60	3.40	2.00	2.80			
Spiny dogfish	12.90	3.80	32.50	9.70		4.10		25.30	3.40	4.90
Splitnose rockfish										
Spotted ratfish	1.20	0.20	4.20	0.20	1.40	1.20	3.30	3.20	1.40	5.00
Threadfin sculpin										
Walleye pollock	0.40	2.50	3.10	3.80	3.00	6.80	0.30	5.30		1.80
Widow rockfish										
Wolf eel										
Yelloweye rockfish										1.60
Yellowmouth rockfish										1.80
Yellowtail rockfish		17.90								
Other	0.10	5.10	1.30	7.70	2.21	1.00	1.40	2.80		34.20
Total	59.30	79.90	191.30	221.80	181.31	215.30	125.80	148.20	30.60	241.00

Species	161	162	163	164	165	166	167	168	169	170
Arrowtooth flounder	12.10	89.80		7.80		8.40			0.70	7.90
Big skate										
Bigmouth sculpin										
Blackbelly eelpout										
Blackfin sculpin										
Bocaccio										
Brown rockfish										
Canary rockfish		2.80								
Chub mackerel										
Curlfin sole										
Darkblotched rockfish								2.50		0.60
Dover sole	3.10	56.20		13.00	14.70	7.00	6.50	10.30	3.40	7.60
English sole									0.40	0.70
Eulachon					0.30		0.30			
Flathead sole										
Greenstriped rockfish										
Lingcod		4.60								
Longnose skate				1.80	3.40					
Pacific cod	8.20	0.60					0.40			4.20
Pacific hake	1.40	1.80		5.10	7.00	18.50	1.40		1.20	0.60
Pacific halibut										
Pacific ocean perch	128.00	47.40		10.20	34.60	39.70	61.50	70.20	26.60	137.70
Pacific sanddab										
Petrale sole		5.30								1.20
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish	4.50	115.10		0.60	4.20	2.10	2.50	0.20	9.40	52.00
Redstripe rockfish										
Rex sole	0.60	123.50		9.50	4.70	6.10	3.50	5.60	1.40	3.30
Rosethorn rockfish							0.50		0.50	
Rougheye rockfish				5.70	3.60	6.60	2.50	2.40		1.00
Roughtail skate										
Sablefish	9.90	2.60		20.20	24.80	15.50	5.40	24.40	17.00	17.00
Sandpaper skate				0.80		1.00				
Sharpchin rockfish										1.00
Shortraker rockfish				8.50						
Shortspine thornyhead		2.00		8.70	10.80	13.30	20.10	23.10	23.30	3.00
Silvergray rockfish	38.90	32.00						2.20	5.40	
Slender sole		2.40							0.40	
Southern rock sole										
Spiny dogfish	2.60			2.20			6.20			4.30
Splitnose rockfish							3.90	1.70	7.50	13.20
Spotted ratfish	2.30								1.10	
Threadfin sculpin										
Walleye pollock	5.10	1.80					1.20	3.30	4.80	3.80
Widow rockfish										
Wolf eel										
Yelloweye rockfish										
Yellowmouth rockfish										
Yellowtail rockfish										
Other	0.20	6.50		72.40	42.80	57.60	1.10	1.80	2.30	3.80
Total	216.90	494.40		166.50	150.90	175.80	117.00	147.70	105.40	262.90

Species	171	172	173	174	175	176	177	178	179	180
Arrowtooth flounder	2.80		20.40	3.40	6.00	25.80	451.00	8.10		2.40
Big skate										
Bigmouth sculpin										
Blackbelly eelpout										
Blackfin sculpin					0.50	1.40	0.80	1.30		0.50
Bocaccio										
Brown rockfish										
Canary rockfish										
Chub mackerel										
Curlfin sole										
Darkblotched rockfish								26.60		12.10
Dover sole	4.00	1.50	30.90	17.90	16.70	19.80	13.80	0.70		4.40
English sole										
Eulachon										
Flathead sole										
Greenstriped rockfish										
Lingcod										
Longnose skate							3.30			
Pacific cod	5.40			3.60	0.80			4.80		1.80
Pacific hake	1.50		21.40	21.30	4.70	16.40				2.50
Pacific halibut	8.60			35.20			4.80			
Pacific ocean perch	58.70	224.70	54.00	62.80	188.70	332.30	456.30	1586.30	2200.00	957.50
Pacific sanddab										
Petrale sole	0.60						1.20			
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish	7.90	1.00	2.70	8.70	8.30		33.70	3.60		1.90
Redstripe rockfish										
Rex sole	2.40	2.10	37.90	5.60	3.30	7.10	7.10	1.00		0.20
Rosethorn rockfish					0.40			15.20		7.90
Rougheye rockfish			10.30	1.30	0.70	7.40	7.80	6.20		2.50
Roughtail skate										
Sablefish	6.40		81.30	1.30		2.40	10.50			
Sandpaper skate			0.90			0.70	1.20	1.50		
Sharpchin rockfish					1.70	0.30			45.00	
Shortraker rockfish			14.80							
Shortspine thornyhead	2.80	5.80	18.60	14.40	11.60	80.80	70.00	54.70	23.00	62.60
Silvergray rockfish		13.10		11.90	2.40					3.60
Slender sole	0.20									
Southern rock sole										
Spiny dogfish							3.30			1.60
Splitnose rockfish	50.10	1.80		3.80				41.80		32.30
Spotted ratfish	0.40							1.60		
Threadfin sculpin										
Walleye pollock	14.60	2.60	7.60	11.60	5.10	0.71				
Widow rockfish										
Wolf eel										
Yelloweye rockfish										
Yellowmouth rockfish						2.30		61.00		5.00
Yellowtail rockfish										
Other	0.80	1.00	21.10	2.30	2.30	0.76	1.20			1.20
Total	167.20	253.60	321.90	205.10	253.20	498.17	1066.00	1814.40	2268.00	1100.00

Species	181	182	183	184	185	186	187	188	189	190
Arrowtooth flounder	4.30	9.70	15.70	19.40	28.10	2.70	40.20	182.30	67.80	
Big skate										
Bigmouth sculpin										
Blackbelly eelpout										
Blackfin sculpin	0.76	1.10								
Bocaccio										
Brown rockfish	2.20	1.90								
Canary rockfish					8.40	26.20		43.20		
Chub mackerel										
Curlfin sole										1.80
Darkblotched rockfish	6.40			2.40						
Dover sole	2.20	1.10		17.90	0.90		12.70	118.20		
English sole							1.10		1.00	45.70
Eulachon										
Flathead sole							0.70			
Greenstriped rockfish			1.40			2.10			9.60	
Lingcod			2.00		5.80	10.40			5.60	
Longnose skate					3.10	5.90			3.80	
Pacific cod		6.60	8.80		0.80	8.90		96.60	5.30	9.30
Pacific hake	24.40	3.20	1.80	9.80			32.80			
Pacific halibut								99.50		5.90
Pacific ocean perch	283.40	336.80	953.10	5.30	15.40	0.90	550.30	414.40	15.70	
Pacific sanddab										33.10
Petrale sole					2.20				4.40	0.50
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish	8.80	2.70	1.90		1.40		11.60	46.80		
Redstripe rockfish			177.30		191.50		0.80			
Rex sole			1.40	2.70	16.30	0.30	114.40	45.40	13.80	4.10
Rosethorn rockfish	5.50	4.50				0.50				
Rougheye rockfish	4.60	1.20								
Roughtail skate	4.70					7.40				
Sablefish	3.30	4.50	9.90	77.60	3.90		1.00	8.60	2.00	
Sandpaper skate				0.50						
Sharpchin rockfish	42.70	8.20								
Shortraker rockfish							4.80			
Shortspine thornyhead	28.70	32.90	0.30	4.10			1.10	10.80		
Silvergray rockfish	7.70	1.80	16.70		175.50	43.60	4.00	188.80		
Slender sole					0.90			1.40		
Southern rock sole										20.60
Spiny dogfish					6.30	1.70			9.90	
Splitnose rockfish		1.80								
Spotted ratfish			0.20	2.60	6.80	8.30	0.60	10.80	17.50	3.00
Threadfin sculpin									3.40	0.20
Walleye pollock	3.30	0.60	2.90		0.30	8.40		13.00	0.04	
Widow rockfish								22.30		
Wolf eel										
Yelloweye rockfish						2.50				
Yellowmouth rockfish	22.40		13.00				6.60	284.70		
Yellowtail rockfish					176.40		1.90			
Other	0.10	0.70		13.30		1.40			3.40	0.80
Total	455.46	419.30	1206.40	155.60	644.00	131.20	784.60	1586.80	163.24	125.00

Species	191	192	193	194	195	196	197	198	199	200
Arrowtooth flounder	26.60	11.20	3.70	3.50	6.80	3.50		209.60	163.60	
Big skate										6.90
Bigmouth sculpin										
Blackbelly eelpout								1.10	22.30	
Blackfin sculpin										
Bocaccio										
Brown rockfish										
Canary rockfish			2.20						2.40	
Chub mackerel										
Curtfin sole										
Darkblotched rockfish				0.60		2.40				
Dover sole	3.70	1.50	4.30	0.20		35.10		125.80	90.90	
English sole	28.40							1.50	0.50	5.10
Eulachon										
Flathead sole	0.50							14.90	13.30	
Greenstriped rockfish	1.00	12.80							1.40	
Lingcod	7.20									4.20
Longnose skate										
Pacific cod	3.60								2.60	4.30
Pacific hake		9.80	64.80	33.50	13.40	5.80			0.90	
Pacific halibut										
Pacific ocean perch		21.40	69.00	398.40	95.70	140.50		1.40	1.10	2.90
Pacific sanddab	6.50									74.40
Petrale sole	2.00									4.70
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish				10.50	2.70	1.00		6.30		
Redstripe rockfish			23.90			0.40		0.40	33.20	1.30
Rex sole	27.80	2.80	5.90			0.80		106.30	90.20	0.70
Rosethorn rockfish		5.10	1.20	1.30						
Rougheye rockfish					0.40					
Rougntail skate										
Sablefish				12.50	5.70	2.40		20.60	104.70	
Sandpaper skate										
Sharpchin rockfish		67.40	34.20							
Shortraker rockfish										
Shortspine thornyhead			0.60	32.60	21.30	18.60				
Silvergray rockfish	16.50	9.20	4.40	1.10				4.60	2.30	
Slender sole								4.20	2.60	
Southern rock sole	1.40									1.60
Spiny dogfish				2.10	2.10	4.20		3.40	7.50	
Splitnose rockfish						2.90				
Spotted ratfish								7.80	1.40	10.70
Threadfin sculpin	0.30	0.20							0.40	
Walleye pollock									10.60	
Widow rockfish										
Wolf eel										
Yelloweye rockfish		4.30	2.20							
Yellowmouth rockfish		11.20	24.30	2.20	0.90	3.80				
Yellowtail rockfish		5.10	17.40					81.10	3.10	
Other	1.10				10.20	1.10		2.30	3.90	2.90
Total	126.60	162.00	258.10	498.50	159.20	222.50		591.30	558.90	119.70

Species	201	202	203	204	205	206	207	208	209	210
Arrowtooth flounder			197.30	86.40	83.30	93.20	13.40			
Big skate										
Bigmouth sculpin										
Blackbelly eelpout			0.40		2.90	14.00				
Blackfin sculpin										
Bocaccio										
Brown rockfish							2.90			
Canary rockfish			1.70				67.70	2.90	2.50	
Chub mackerel										
Curlfin sole	0.50	0.40								
Darkblotched rockfish										
Dover sole		0.10	8.30	6.80	19.70	120.50	3.00			
English sole		65.30	37.30	41.80			2.90	1.10		
Eulachon										
Flathead sole		0.10	2.20	0.30	12.20	12.50				
Greenstriped rockfish			0.50				6.22			
Lingcod						6.10	7.70		5.00	
Longnose skate					8.80	11.70				
Pacific cod	4.50	3.80	18.40						1.40	
Pacific hake										2.40
Pacific halibut		14.40								
Pacific ocean perch					1638.00	341.40				411.40
Pacific sanddab	19.70	90.00			1.40	1.60				
Petrale sole			1.70	1.60						
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish										11.40
Redstripe rockfish					0.60		16.00	12.30	233.80	37.60
Rex sole		0.40	64.60	76.40	55.90	44.70	8.20	2.90	1.30	0.50
Rosethorn rockfish							4.20	2.40	1.30	0.90
Rougheye rockfish					1.40	0.60				
Roughtail skate										
Sablefish			3.10	2.60	5.20	22.80	5.10		1.50	
Sandpaper skate					0.10					
Sharpchin rockfish							56.90	18.40	16.10	61.70
Shortraker rockfish										
Shortspine thornyhead										1.30
Silvergray rockfish			120.30	29.10	5.40		36.20	2.60	8.80	3.10
Slender sole										
Southern rock sole		3.70								
Spiny dogfish			4.40	1.70	1.80					
Splitnose rockfish										
Spotted ratfish	5.20	15.30	5.40	7.30	0.30	0.40	2.30		0.30	
Threadfin sculpin										
Walleye pollock					2.60		14.20	1.80	0.70	
Widow rockfish										13.50
Wolf eel										
Yelloweye rockfish							14.70		3.30	
Yellowmouth rockfish										412.00
Yellowtail rockfish										
Other			1.50	1.50	1.30	2.40	9.60	2.70	4.90	0.10
Total	29.90	193.50	467.10	255.50	1840.90	671.90	271.22	47.10	280.90	955.90

Species	211	212	213	214	215	216	217	218	219	220
Arrowtooth flounder		1.60	0.60		1.90		2.20	3.70	4.70	6.10
Big skate										
Bigmouth sculpin										
Blackbelly eelpout			0.10		0.10	0.20		0.68	0.12	
Blackfin sculpin		0.30								
Bocaccio										
Brown rockfish										
Canary rockfish										
Chub mackerel										
Curlfin sole										
Darkblotched rockfish		18.70		7.20						1.50
Dover sole		1.40	28.50	7.70		0.30			0.20	7.20
English sole										
Eulachon										
Flathead sole										
Greenstriped rockfish	0.20									
Lingcod										
Longnose skate					16.30	6.90	3.00	3.30		
Pacific cod										
Pacific hake		71.20	70.10	81.90	9.10	2.50	5.50	19.00	39.00	106.50
Pacific halibut										
Pacific ocean perch	6.40	38.70	379.80	152.30	132.90	55.90	362.40	132.50	68.60	40.60
Pacific sanddab										
Petrale sole										
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish	4.20	6.10	16.10	6.30	1.60		2.10		1.40	
Redstripe rockfish	8.50									
Rex sole		0.90	15.50	15.50	1.00					
Rosethorn rockfish	0.68	1.20								
Rougheye rockfish				14.90	9.00	4.90	15.80	21.50	2.80	
Roughtail skate										
Sablefish			16.40	17.80	19.30	22.20	43.50	23.20	7.80	4.60
Sandpaper skate					1.02	0.92		0.50		
Sharpchin rockfish	44.90									
Shortraker rockfish				10.40						
Shortspine thornyhead	0.30	19.00	48.80	28.80	36.10	14.80	13.20	10.20	10.00	8.70
Silvergray rockfish		1.20	1.20							
Slender sole									0.22	0.20
Southern rock sole										
Spiny dogfish								2.60		
Splitnose rockfish		3729.70								
Spotted ratfish				1.10						
Threadfin sculpin										
Walleye pollock	0.20	0.70	1.20	0.50						
Widow rockfish	60.40			1.30						
Wolf eel										
Yelloweye rockfish										
Yellowmouth rockfish	98.30	108.30	4.40							
Yellowtail rockfish										
Other		0.90	5.90	6.60	1.40	5.30	4.12	29.34	14.28	25.10
Total	224.08	3999.90	588.60	352.30	229.72	113.92	451.82	246.52	149.12	200.50

Species	221	222	223	224	225	226	227	228	229	230
Arrowtooth flounder	3.80	5.00	2.60	19.40	21.80	0.30		5.20	22.90	31.10
Big skate										
Bigmouth sculpin										
Blackbelly eelpout			0.50				0.50			
Blackfin sculpin			0.40					3.30		
Bocaccio				5.00						
Brown rockfish										
Canary rockfish				7.80	4.40					
Chub mackerel										
Curlfin sole										
Darkblotched rockfish		3.70	9.10				1.60	98.00	7.30	
Dover sole	29.50	2.40	5.30		4.00	7.40	36.50	4.14	27.80	19.70
English sole				2.50	1.60					
Eulachon										
Flathead sole										
Greenstriped rockfish				4.20	4.70	33.90				1.22
Lingcod				13.00	9.80					
Longnose skate					21.30		3.20			8.40
Pacific cod				6.30	11.10					
Pacific hake	10.60	21.00	15.60			6.80	59.20	111.40	64.70	71.32
Pacific halibut				4.30						
Pacific ocean perch	162.70	287.20	499.10			841.28	117.40	1611.40	349.50	604.28
Pacific sanddab										
Petrale sole					3.70	3.00				
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish	3.20	1.80	3.30	5.10	1.20	1.40		11.70	11.00	4.52
Redstripe rockfish				5.30	1.90	85.20				
Rex sole	38.10	5.14	1.40	33.00	18.00	25.00	29.30	7.30	11.80	9.92
Rosethorn rockfish		9.80	5.70	0.10				21.70	2.40	0.50
Rougheye rockfish	35.50						613.10		401.00	9.56
Roughtail skate										
Sablefish	1.30	3.50		3.50		5.40	29.40		32.10	22.10
Sandpaper skate										6.80
Sharpchin rockfish	0.50	0.90						3.90		8.06
Shortraker rockfish							42.50			
Shortspine thornyhead	5.90	36.60	27.90			0.10	53.10	96.20	57.40	7.26
Silvergray rockfish			1.70	84.40	15.80	1.50				2.98
Slender sole	0.90	0.40	0.20	2.20	1.20	0.30				0.68
Southern rock sole					0.80					
Spiny dogfish			1.40	6.20	1.10					
Splitnose rockfish	0.90	92.10	216.60					360.50		
Spotted ratfish			2.60	0.30	1.40		1.20	5.40		
Threadfin sculpin										
Walleye pollock	8.70			4.00	3.10	1.10				0.32
Widow rockfish										0.92
Wolf eel										
Yelloweye rockfish				1.90	3.20					
Yellowmouth rockfish	47.20	207.80	494.20			43.20		441.60		7.72
Yellowtail rockfish										
Other	0.50	6.10	2.70	5.70	2.30		1.70	4.00	6.60	5.62
Total	349.30	683.44	1290.30	214.20	132.40	1055.88	988.70	2785.74	994.50	822.98

Species	231	232	233	234	235	236	237	238	239	240
Arrowtooth flounder	82.40	163.70	38.30		5.10	38.20	4.50	6.50	3.20	29.00
Big skate										
Bigmouth sculpin										
Blackbelly eelpout	0.40							0.22		
Blackfin sculpin								0.10		
Bocaccio	12.60	4.30								
Brown rockfish										
Canary rockfish	62.00	2.80								
Chub mackerel										
Curlfin sole										
Darkblotched rockfish						1.80		1.80	5.30	
Dover sole	28.80	47.90	4.20			53.80	59.00	8.80	3.00	42.80
English sole		5.60	10.20			0.70	0.30			0.50
Eulachon										
Flathead sole	0.20		0.04							4.10
Greenstriped rockfish	0.60	4.80	17.00							
Lingcod	7.60			12.20	66.80					
Longnose skate	11.80		1.70			2.20		2.16		
Pacific cod	25.40		6.00			3.60		1.06		9.80
Pacific hake	1.90	13.00	7.90	2.60		31.80	118.30	60.30	81.10	89.60
Pacific halibut			3.40	3.80	30.20					
Pacific ocean perch		284.90				288.24	389.30	963.90	533.30	900.00
Pacific sanddab				2.20	0.40	0.70				1.00
Petrale sole	3.90		1.20		0.40					
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish	97.80	13.80				13.60		19.80	18.00	18.10
Redstripe rockfish	3.40		10.40							
Rex sole	37.60	17.80	45.20		0.60	73.20	6.90	2.10	3.00	39.40
Rosethorn rockfish								2.30	2.00	
Rougheye rockfish						1.60	0.80	0.40	2.00	19.90
Roughtail skate										
Sablefish	1.30	56.90	7.00			2.60	64.00	19.50	17.80	5.00
Sandpaper skate										
Sharpchin rockfish										
Shortraker rockfish										
Shortspine thornyhead		6.00				13.80	27.60	41.10	23.60	8.60
Silvergray rockfish	12.30	2.30	24.90	3.10						
Slender sole	1.60	2.30	2.30							
Southern rock sole				54.20	24.00					
Spiny dogfish										
Splitnose rockfish										
Spotted ratfish			0.80			1.00	0.90			1.20
Threadfin sculpin										
Walleye pollock		0.30						0.52		1.90
Widow rockfish	4.50									
Wolf eel					4.10					
Yelloweye rockfish										
Yellowmouth rockfish		4.50						1.30		
Yellowtail rockfish	88.90		11.10							
Other	2.40	3.60			0.10	7.50	5.00	7.20	0.70	1.90
Total	487.40	634.50	191.64	78.10	131.70	534.34	676.60	1139.06	693.00	1172.80

Species	241	242	243	244	245	246	247	248	249	250
Arrowtooth flounder	22.40	14.90	29.10	17.80	17.20		16.00	113.50	32.30	16.60
Big skate						8.20				
Bigmouth sculpin										
Blackbelly eelpout		0.10		3.20	0.40		0.40	0.70		0.20
Blackfin sculpin										
Bocaccio			5.70							
Brown rockfish										
Canary rockfish		19.50	6.40			4.90				
Chub mackerel						74.70				
Curlfin sole										
Darkblotched rockfish										
Dover sole	94.20	1.80	30.80	72.00	7.40		63.20	67.50	21.90	4.10
English sole		31.60	5.50		2.50		20.30	0.40		0.40
Eulachon								1.50	0.10	4.40
Flathead sole			11.40	3.50	14.00		16.10	1.10	2.80	0.10
Greenstriped rockfish					0.50				0.50	
Lingcod		9.60				7.80				
Longnose skate					2.50		5.70	5.26		3.30
Pacific cod		26.30			1.70			7.50		1.50
Pacific hake	15.90		19.10	14.30	94.00		51.50			
Pacific halibut		6.40	6.30		8.80		4.80			
Pacific ocean perch	398.90	1.00	743.60	290.70	252.60		1185.90	19.50	916.50	0.50
Pacific sanddab				1.50		15.30	2.50			
Petrale sole		1.90			0.80			2.40		
Pygmy rockfish										
Quillback rockfish										
Redbanded rockfish	12.30		27.40	8.10	3.30		5.50	4.70	4.10	25.00
Redstripe rockfish									1.00	0.50
Rex sole	52.60	7.00	56.10	24.70	14.30		59.50	7.60	17.70	5.40
Rosethorn rockfish										
Rougheye rockfish	2.20			13.90						
Roughtail skate										
Sablefish	4.50		3.90	56.60	2.10		4.50	5.80		2.20
Sandpaper skate					1.00					
Sharpchin rockfish										
Shortraker rockfish										
Shortspine thornyhead	13.20		1.80	14.90	8.20		1.30	5.90	0.40	
Silvergray rockfish		10.20	6.22	1.80					43.80	
Slender sole			1.70		2.10					
Southern rock sole						59.90				
Spiny dogfish	2.80				1.10		0.60			
Splitnose rockfish				1.10						
Spotted ratfish		1.00	0.30					0.30	1.70	
Threadfin sculpin										
Walleye pollock		2.60								
Widow rockfish										
Wolf eel										
Yelloweye rockfish										
Yellowmouth rockfish								2.20	3.90	
Yellowtail rockfish		1.70							5.20	4.10
Other	1.30	1.70			0.20	0.10		7.00	1.30	1.40
Total	620.30	137.30	955.32	524.10	434.70	170.90	1437.80	252.86	1053.20	69.70

Species	251	252	253
Arrowtooth flounder	66.70	35.10	12.50
Big skate		0.10	
Bigmouth sculpin			
Blackbelly eelpout	1.90		
Blackfin sculpin			
Bocaccio			
Brown rockfish			
Canary rockfish		2.50	0.50
Chub mackerel			
Curlfin sole			1.20
Darkblotched rockfish			
Dover sole	4.40	3.50	
English sole		23.60	48.10
Eulachon	0.20		
Flathead sole	12.90	0.70	
Greenstriped rockfish			0.30
Lingcod		19.30	5.10
Longnose skate	6.50		11.90
Pacific cod	2.80	0.40	6.80
Pacific hake			
Pacific halibut		4.50	7.40
Pacific ocean perch	52.00		
Pacific sanddab	0.10		74.70
Petrale sole		11.50	0.90
Pygmy rockfish			
Quillback rockfish			
Redbanded rockfish	3.00		
Redstripe rockfish	0.80		
Rex sole	28.20	22.10	3.20
Rosethorn rockfish			
Rougheye rockfish			
Roughtail skate			
Sablefish			
Sandpaper skate			
Sharpchin rockfish			
Shortraker rockfish			
Shortspine thornyhead			
Silvergray rockfish	4.60	2.00	
Slender sole			
Southern rock sole			10.30
Spiny dogfish	1.00		0.80
Splitnose rockfish			
Spotted ratfish	4.70	3.20	3.40
Threadfin sculpin			
Walleye pollock			
Widow rockfish			
Wolf eel			
Yelloweye rockfish			
Yellowmouth rockfish	1.50		
Yellowtail rockfish	7.70		
Other		2.30	
Total	199.00	130.80	187.10